## COMPUTERWORLD

## Desktop leaders face off

#### Novell to buy WordPerfect, Quattro Pro

By Lynda Radosevich and Elisabeth Horwitt SALT LAKE CITY

Novell, Inc.'s planned buyout of WordPerfect Corp. and Borland International, Inc.'s Quattro Prospreadsheet leaves users in a quandary.

While customers said it should provide much-needed financial support for WordPerfect's product development, they fear it could distract Novell from meeting already ambitious enterprise network goals.

Novell is having trouble both delivering its NetWare 4.1 software and integrating NetWare and Unix. Users also fret that Novell's lack of desktop application experience and reportedly poor support policies would undermine WordPerfect and Quattro Pro support programs.

"Novell has hugely disappointing support. You can't call a number there and get help unless you want to pay \$100 to \$200 per call, and we're big enough that we shouldn't have to do that," said Dean Johnson, a manager of information systems for special projects at Freudenberg-NOK General Partnership, an auto parts manufacturer in Bristol, N.H.

Novell, page 14

Squeeze play				
Microsoft's worldwide market share gains are driving consolidation in the PC applications				
business Percent				
Application	1993 revenue*	change from 1992		
Word processing				
WordPerfect	\$647M	31%		
Microsoft	\$845M	31%		
Lotus	\$154M	(14%)		
Spreadsheets	and Michaelman School Robbert			
Lotus	\$599M	19%		
Microsoft	\$647M	34%		
Borland	\$79M	(35%)		
Database				
Borland	\$266M	(10%)		
Microsoft	\$191M	247%		
Claris Corp.	\$56M	80%		

Source: Dataquest, Inc., San Jose, Calif

#### Microsoft counterattacks

By Stuart J. Johnston

Microsoft Corp. plans to undermine Novell, Inc.'s network dominance with a Trojan horse strategy built around its object technology and aggressive pricing of Windows NT, according to a confidential company memo obtained by *Computerworld*.

As the Redmond, Wash., software titan looks around hungrily for new markets to refuel its slowing growth rate, networking and server technologies are major candidates, the memo states. Novell's announced intent to purchase WordPerfect Corp. makes the strategy outlined in the memo especially timely.

"Novell is this business. We have to take them out," Jim Allchin, vice president of Microsoft's business systems division, said in a Microsoft, page 15

## Gerstner downplays host role

By Craig Stedman

IBM Chairman Louis V. Gerstner last week tried to get the "vision thing" monkey off his back by laying out a strategic road map for returning the vendor to prosperity. But he gave few specifics about the vehicles IBM will use to get there.

Gerstner, in a speech to financial analysts in New York, highlighted key changes ahead:

A client/server strategy that revolves around basing the OS/2, AIX and OS/400 operating systems on PowerPC microprocessors and a common microkernel. The commonality will mean faster software development, lower prices and more consistency among IBM's non-mainframe systems.

A "massive redeployment" of re-Gerstner, page 6

#### Outsourcing

## Xerox signs up EDS

By Mark Halper

In an apparent bellwether of change in the outsourcing field, a financially sound Xerox Corp. last week said it will hand over its IS operations to Electronic Data Systems Corp. The deal could be worth as much as \$4.1 billion over 10 years.

Xerox's decision to outsource symbolizes the growing willingness of fiscally solid companies to enter such arrangements. Outsourcing has more typically been the province of companies needing immediate cash infusions and quick cost savings.

"It's a watershed deal," said Howard Anderson, managing director at The Yankee Group in Boston. "There's a whole raft of other companies who will seriously consider the outsourcing option with the idea that Xerox did it."

Xerox showed an operating profit of \$620 million on sales of  $\mathbf{Xerox}$ , page 10

The EDS/Xerox deal is near the top of the list of biggest outsourcing contracts. These contracts will last for approximately 10 years.				
VALUE YE CUSTOMER VENDOR (BILLIONS) SIG				
EDS	\$2.5 - \$4.1	*		
ISSC	\$3 1992			
CSC	\$3	1991		
EDS	\$2.1	1991		
EDS	\$2	*		
EDS	\$1.5	*		
CSC	\$1.5	1994		
EDS	\$1	1993		
SHL	\$1	1993		
	VENDOR EDS ISSC CSC EDS EDS EDS CSC EDS	VENDOR (BILLIONS)  EDS \$2.5 *\$4.1  ISSC \$3  CSC \$3  EDS \$2.1  EDS \$2  EDS \$1.5  CSC \$1.5  EDS \$1		

Billion-dollar babies

#### 1/

Source: Merrill Lynch & Co., New York

\*Deals pending

### Utilities plug into client/server

By Joseph Maglitta

Three of the nation's leading electric utilities are crackling with plans for big client/server rollouts.

Those plans are driven in part by competitive pressures that have sent electric and gas utilities around the world scrambling for new ways to harness information technology for survival and growth. These factors include deregulation, environmental pressures, privatization, globalization and sagging profits.

Among the utilities making a move are the following:

► Entergy Corp., a \$6 billion New Orleans-based power supplier, will this week announce plans to move corporatewide applications to client/server systems provided by Sun Microsystems Computer Corp. The new systems will sup-



"Utilities have a chance once every 20 years to redo their technology.
This is it."

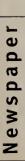
— Brad Holcombe, Andersen Consulting

port 6,500 users on 300 LANs.

➤ Florida Power Corp. in St. Petersburg last week said it was in the final phases of a three-year, \$48 million rollout of a new open network, customer service system and other applications based on Hewlett-Packard Co. client/server technology.

▶ Pacific Gas & Electric Co. said it expects a March 1995 introduction of a client/server-based customer service system for 20,000 key industrial accounts. The \$10.6 billion firm, based in San Francisco, is the nation's largest public utility.

The reason for this rush to client/server is clear. "Until recently, Utilities, page 8



## Table of Contents

#### **NEWS FROM UNIFORUM**

- ■Watch for new challenges to Unix by Windows NT in the coming year, particularly in LAN environments, according to UniForum attendees. Page 4
- Bug fix duc for Sun's Wabi. Page 4. Sun signs on as a sponsor of OSF. Page 30

#### **NEWS**

- Taligent demonstrates the application frameworks that make up a key part of its object-oriented operating system. Page 4
- •Unisys says users can run on-line transaction processor and decision support against the same database without hurting performance. Page 6
- ■Satellite network backers talk big, but not all of them will survive in the future. Page 12
- Sybase ships a beta version of a graphical development tool but remains vague about its repository strategy. Page 16
- ■1BM turns its eye to Ethernet. Page 20

#### **DESKTOP COMPUTING**

■Microsoft releases new Access and FoxPro versions at bargain basement prices. Page 39

#### **WORKGROUP COMPUTING**

■IBM enhances both its Ethernet and Token Ring product lines. Page 47

#### **ENTERPRISE NETWORKING**

■Corporate managers are caught in a messaging gap: They aren't happy with their



existing directory structures but don't have enough confidence in the X.500 standard to base purchase decisions on it. Page 51

#### LARGE SYSTEMS

Gradient Technologies' plan to develop an end-user version of its license manager received a guarded reaction from IS executives who are concerned about price. Page 55

#### APPLICATION DEVELOPMENT

■ Vendor hype is frustrating corporate developers. Page 61

#### **CAREERS**

Re-engineering experience may get you in the door, but once you're in, expect to put your money where your mouth is. Page 92

#### **MARKETPLACE**

Options in the bulletin board systems software market vary so widely that the more you see, the better your decision will be. Page 104

#### THE CW GUIDE TO WIRELESS

Wireless data communications works - if you have vast resources to deal with the cost and complexities. It's "too expensive, coverage is not broad enough, the applications are not there, the bat-



teries don't last long enough, and the equipment is too large and clunky," savs Dick Schaffer, a principal at Technologie Partners in New York. **PAGE 75.** 

#### **COMMENTARY**

- ■Charles Babcock says object-oriented Cobol represents one more way to move legacy applications to distributed systems. Page 6
- ■Paul Gillin advises Novell's Ray Noorda to call off the WordPerfect and Quattro Pro deals. Page 34
- ■Marc Dodge says the mainframe and the PC are both dead — and alive and well. Page 35
- ■Patricia Seybold warns that IS managers and companies that don't get onto the Internet will be out of business. Page 35
- ■Melissa Cook says re-engineering should include separation of data from processes. Page 61

CalendarPage 73
Company IndexPage 108
Editorial/Letters to the editorPage 34
Friday Stock TickerPage 109



Boston trial lawver Bruce A. Bierhans

## AAAIIA

The topic? Faulty software. The argument? Two lawyers debate whether faulty software is a real problem for users or merely a way for attorneys to make money. Either way, user companies should scrutinize their warranties.



ITAA general counsel Ronald J. Palenski

#### **Executive Briefing**

Free money! The Detroit Public Library, Magic Valley Regional Medical Center and other nonprofits are financing new information systems with grants from private and government sources. You can do it too — if you know where the money is and how to play the game. Page 65



Customers are ruffled by Novell's plans to purchase WordPerfect and Borland's Quattro Pro spreadsheet. Some are worried about Novell's splintered focus and declining support. Others see the move as saving WordPerfect and Borland from themselves and as opening up possibilities for better network applications. Page 1

Forces such as environmental pressure, slumping profits and globalization are driving three of the nation's major electric utilities — Entergy Corp., Florida Power Corp. and Pacific Gas & Electric — toward client/server technology and open systems.

EDS wins the big one: Xerox agrees to go with EDS on what could be the largest outsourcing contract ever. Page 1

Increased interest in disaster recovery is pushing some companies to buck the data center consolidation trend and open remote facilities as internal hot sites. Data center managers at the AFCOM conference said the remote facilities should allow faster recoveries than they could get at external hot sites, although the cost is prohibitive for some companies. Page 8

When Harvard University taps its alumni for a new wave of contributions, a client/server system will not only keep track of the eash flow but will help to manage the delicate negotiations needed to bring in some multimillion-dollar donations. Page 47

The question lingers, do you replace your outdated PCs or upgrade them? Some users say the financial benefit lies in upgrades such as reworking old memory chips. Page 39

Users need to modernize their network security practices, computer security experts say. Page 28

Management guru Tom Peters tells CIOs that weird is good, reengineering is flawed, outsourcing is dumb and narrow return on investment analyses are worse. Page 71

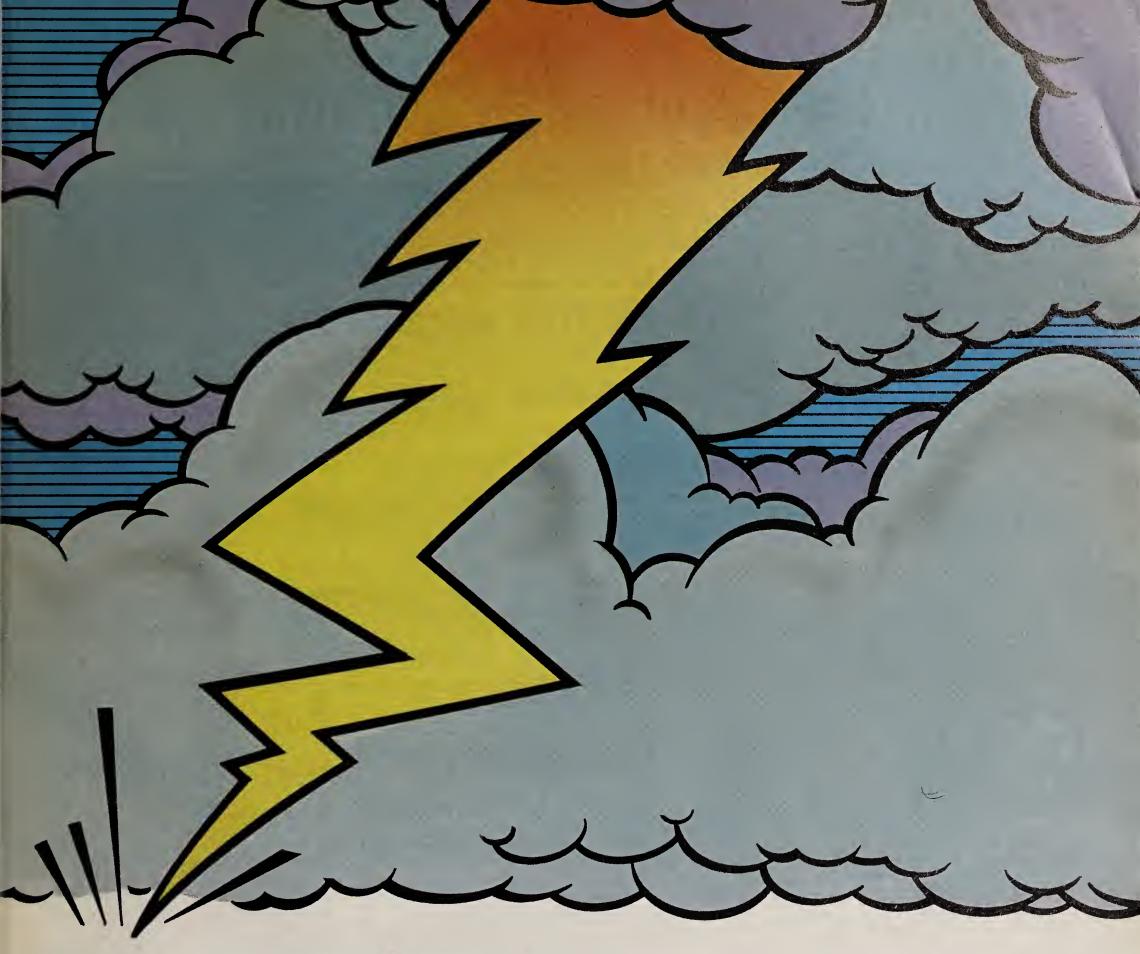
#### HOW TO CONTACT COMPUTERWORLD EDITORIAL:

	FRUNE:	FAX;
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090	(201) 712-1808
Washington bureau, Washington	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill.	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif.	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash.	(206) 641-7770	(206) 747-1021

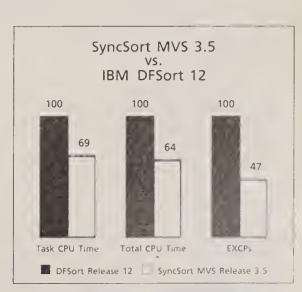
#### BY ELECTRONIC MAIL:

Computerworld's writers and editors have individual MCI Mail accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

- Our CompuServe account number is 76537,2413. Please use that account only for communications with writers and editors. Direct subscription inquiries to CompuServe: 73373,1230.
- Exters to the editor and other editorial-related messages can be sent via Internet to letters@cw.com
- SUBSCRIPTIONS: Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.
- REPRINTS: Contact Sharon Bryant at (508) 820-8125.
- RAPID REFERENCE CLIPPING SERVICE: (800) 343-6474 X554.



IF IT WERE GREASED, IT WOULD BE ALMOST AS FAST AS SYNCSORT.





## Taligent goes public with operating system

Developers are slow to sign on

By Ed Scannell
Phoenix

■ Taking the first steps in what it figures will be a long journey to market acceptance, Taligent, Inc. last week gave its first public demonstration of the application frameworks that compose a significant part of its object-oriented operating system.

At the PC Forum conference held here, company officials demonstrated via their "people, places and things" concept how easy it will be for corporate and third-party developers to create customized applications and navigate the system.

One of the strengths of the operating system, which company officials said will be delivered by the end of 1995, is its ability to transparently integrate various data types from multiple environments — including DOS, Windows and Unix environments — into a single document.

"The way you can pick up any pen to write on any piece of paper is the way we want people to think of Taligent and the way it works with different applications," said Mike Potel, Taligent's vice president of technology development.

Also key was Taligent's claim that due to the operating system's object-oriented architecture, applications can be written with much less code than comparable programs running in environments such as Windows.

To illustrate, Taligent demonstrated an application that consisted of only 100 lines of code. The same software for Windows would require several thousand lines of code, Potel said.

#### Usershesitate

While many attendees were impressed with the technology, a show of hands at the conference revealed only

one out of 500 or so is actively developing for Taligent.

"It's impressive stuff, but it's a long way from being relevant to anything we are looking at right now," said one information systems professional at a large New York-based bank.

Sixty developers have already committed to writing applications for the second series of application frameworks, which are due out later this year and will allow developers to fully exploit the operating system, according to Taligent Chairman and Chief Executive Officer Joe Guglielmi.

The first set of frameworks allows developers to infuse existing applications with advanced features such as sophisticated data manipulation and three-dimensional graphics. The second set will let developers

more fully exploit the Taligent system by writing sophisticated collaborative applications that take advantage of the operating system's user interface.

As demonstrated, the "people, places and things" concept extensively uses icons that represent office objects such as phones, fax machines and business cards. Users can drag a business card onto a phone or fax icon and have their modem automatically dial the number.

Or they can drag the card into a data-entry form so the data transfers automatically into the correct database fields.

#### Different pace

While Taligent is delivering the frameworks to both co-parent companies — IBM and Apple Computer, Inc. — at the same time, IBM appears to be working with the technology much more aggressively than Apple. The latter has been quiet about its implementation plans.

"IBM is looking closely at the various versions of the [frameworks] as we deliver them, but Apple isn't doing much until we deliver the final product," Guglielmi said. "It may be because Apple doesn't yet have a preemptive multitasking operating system."

# As time goes by IBM and Apple plan to have the Taligent operating system out by mid-1995. 1994 will be a year of testing and pre-releases. Early Experience kit: First-half 1994 Gets early feedback Goes to 100 developers Programming model Prototype applications Beta release: End of 1994 Will contain portable Taligent Application Environment (TAE) Broad-based developer's kit Partner development programs Release 1.0: Mid-1995 Has complete graphical interface Simultaneous partner releases

Broad-based marketing campaigns

#### **Operating systems**

### Users seek Unix/NT coexistence

The new OSF sponsors,

each of which agreed

to pay \$1 million

annually, include AT&T

Global Information

Solutions, SunSoft,

Inc., a subsidiary of

Sun Microsystems,

Inc., Novell, Inc. and

Fujitsu Ltd. — double

the previous number of

OSF sponsors. They

join former sponsors

IBM, Digital Equipment

Corp., Hewlett-

Packard Co. and

Hitachi Ltd. — plus

eight other associate

sponsors that paid

less.

By Jean S. Bozman

Unix's grip on the enterprise server may not be under siege yet from Microsoft Corp.'s Windows NT, but NT will increasingly challenge it this year at the workgroup and LAN levels, according to users and vendors attending last week's UniForum trade show and conference.

A primary issue for users, however, is clearly one of coexistence between Unix and NT.

During one of the conference sessions devoted to NT, a consultant asked a packed room of more than 400 users, "Five years from now, do you believe you'll be running your business on Unix or on Windows NT?"

While only a smattering of the audience singled out one or the other operating systems, the vast majority identified Unix and NT together as their future operating environments.

#### New, improved OSF

Ever-conscious of this competitive threat from Microsoft, a host of Unix vendors announced a revamped Open Software Foundation (OSF), with eight corporate sponsors — double the previous number. The new group will house the Common Open Software Environment (COSE) group created at UniForum last year [CW, March 7]. It will also coordinate specifications development closely with X Open Co., which will later certify the open systems standards.

"I would have loved to have seen Microsoft up nere [on the stage], too," said Bill Estrem, projcet leader at 3M Co.'s Information Architecture group in St. Paul, Minn "Whether or not they join this group is not important to me. But if they [Microsoft] can conform to the [OSF] specifications, it would make my life much easier. We're going to be using both [Unix and Windows NT], and we like them both."

Ted Hanss, president of the former OSF's end-user steering committee, said user interest in Unix/NT coexistence is "definitely happening," although users are still puzzling over how to make the two interoperate without more connectivity middleware products.

Customers viewed the new Unix group as a hopeful sign

that vendors want user feedback on proposed Unix standards — something that was impossible with COSE. Now, users will be included on the OSF board, in planning committees and as advisors to specific project working groups.

#### Million-dollar club Representative attitude?

Yet after years of abortive attempts at Unix unity groups, many users may adopt the attitude expressed by David Sherr, a first vice president of information technology at Lehman Brothers in New York.

"Who really eares anymore?" Sherr asked. Another user pointed out that while the OSF committees argue about standards, Microsoft will be "out in the market establishing two or three new de facto standards."

David Tory, who will remain OSF's chief executive officer, said the new OSF board will meet in mid-April to decide on a new name and discuss the details of downsizing the 300-employee staff by at least one-third.

OSF products will continue to be enhanced until their next release, Tory noted, including the planned DCE 1.1 distributed computing software suite set for release at year's end. Also coming are the OSF/1 1.3 operating system and OSF/Motif 2.0 graphical user interface.

### Sun addresses user Wabi woes

By Jean S. Bozman SAN FRANCISCO

Next month's delivery of Wabi 1.1, a new release of Sun Microsystems, Inc.'s Windows application programming interface, will fix flaws discovered after Wabi 1.0 shipped late last year, a Sun official said.

Andy Halford, director of engineering at Sun business unit SunSelect in Chelmsford, Mass., did not provide specifics about the bugs, which analysts said have created problems for at least one of the 13 Windows applications that Wabi supports.

The problems reportedly include some difficulty installing some of the Windows applica-

tions that run over Unix. "SunSelect said earlier this month that one of the harder challenges wasn't so much running the Windows applications as properly installing them," said Tonylams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Repairs were made before Wabi resellers Hewlett-Packard Co. and IBM shipped Wabi code with their workstations, according to SunSelect.

#### Wabi Wanna-bes

SunSelect makes the
Wabi software that
runs Windows
applications on top
of Unix operating
systems.
Hewlett-Packard Co.
and IBM have said
they will ship Wabi
with their
workstations, but so
far only SunSoft, Inc.

has been shipping the

software.

RANK 1992	1991	COMPANY
	1	GENERAL MOTORS Detroit
2	2	EXXON Irving, Texas
3	3	FORD MOTOR Dearborn, Mich.  INTL. BUSINESS MACHINES Armonk, N. V.
4	4	INTL. BUSINESS MACHINE GENERAL ELECTRIC Fairfield, Conn.
5	5	
6	6	MOBIL Fairfax, Va.  PHILIP MORRIS New York
7	7	E.I. DU PONT DE NEMOURS Wilmington
8	8	CHEVRON San Francisco
9	10	TEXACO White Plains, N.Y.
10	9	FR K. Michael Control of the Control

## 8 of the top 10 'Fortune 500' companies are using Oracle7."

Here's what our customers are saying about Oracle7:

- "It's the driving force behind our most sophisticated applications."
- "You can't break it, it just keeps running and running."
- "It's the best Client/Server solution out there."
- "We needed a truly open solution: Oracle7 is it."

To find out more about why companies of all sizes are choosing Oracle7, call us. We'll send you in-depth analysis from IDC and Aberdeen, and you'll see for yourself why everyone is so excited. 1-800-633-1071 Ext.8120



## Cobol seeks new life in object world

obol has been relentlessly criticized since its birth in 1959, but instead of meeting predictions of its imminent demise, it is about to undergo another permutation. This fall, Micro Focus, Inc. in Palo Alto, Calif., will offer the first version of object-oriented Cobol.

It may be hard to see Cobol in this role, and there won't be any stampedes in its direction by Smalltalk and C++ adherents. But there are thousands of Cobol programmers who would like to sidle up to object-oriented development. Many will do so using the language they know best, once they get the chance.

This may not be as simple as it sounds, because the underlying concepts of Cobol are somewhat the antithesis of object-oriented

Granted, thousands of C programmers eased into the world of objects through the object-oriented extensions to C, now known as C++. The latter remains a hybrid language that allows conventional C features alongside object-building capabilities.

A central concept of object-oriented development is creating a base class of objects with subclasses inheriting characteristics from it. Unlike objects created in Smalltalk, a purer objectoriented language, C++ objects can inherit characteristics from multiple base classes, which can lead to complications in an objectoriented system. Nevertheless, C++ has gained popularity while other languages have languished.



There are thousands of Cobol programmers who would like to sidle up to objectoriented development.

Charles Babcock

Another object-oriented language that tried to combine the best of Smalltalk into a C-like language was Objective C. For some reason, it never caught on except with programmers working with Next Computer's NextStep, whose class libraries are written in

Object-oriented Cobol may have a better chance of getting established than Objective C because it has the same inherent advantage as C++. It represents a familiar language that retains its features as it takes an evolutionary step toward a new way of doing things.

Is this the best way to move toward object-oriented develop-

Many object-oriented experts say no. They say Cobol programmers need to break with their past to adopt the underlying tenets of the object-oriented approach. The Cobol programmer is taught to subdivide a business task into smaller parts until a function acting on data can accomplish some small slice of it.

Functional decomposition goes in the opposite direction of forming the higher level abstractions of objects. Objects are discrete modules of code that communicate with one another through messages, simulating real world business entities and processes.

But the differences can be overstated. Object-oriented development remains something less than an exact science, organized around a few key concepts. CICS programmers, which include many Cobol developers, are used to working in an event-driven environment akin to object-oriented environments.

Dan Clarke, product manager of object-oriented Cobol at Micro Focus and chairman of the former task force that came out of the Scottsdale Symposium on Cobol in 1989, says some of the experts' fears that Cobol programmers can't make the transition are actually a form of condescension. Many of them will learn to apply object-oriented rules as well as anyone else, he says.

And it's hard to see how businesses are going to embrace the world of objects if most of their Cobol programs can't be moved overtoit

Like C++ before it, object-oriented Cobol is likely to expand the number of programmers working with objects and help move legacy systems closer to the age of distributed systems.

Babcock is Computerworld's technical editor. His MCt Mait address is 575-2737.

## Unisys merges processing

By Thomas Hoffman

Unisys Corp. last week introduced a mainframe-class database server that allows online transaction processing (OLTP) and decision-support operations to run simultaneously against production data.

While observers agreed the capability could unlock a whole new trove of applications, they questioned whether users would pay the stiff price tag—\$750,000 to \$8 million—for the muItiprocessing machines, which work with IBM, Digital Equipment Corp. and Unix-based systems.

#### **Running simultaneously**

The system, called DataCentral, allows both transaction and query processing to occur at the same time, and against the same database, without performance lapses. Historically, users have had to maintain separate database environments for OLTP and decision-support functions. Each kind of activity has different functional characteristics.

With DataCentral, because both kinds of processing can take place at once, users need just one centralized database environment and thus less disk space. Another benefit is the ability to extract OLTP data for use in decision-support applications.

DataCentral includes up to 32 parallelized CMOS processors that interface with high-

speed disk caching systems. With DataCentral, up to 85% of OLTP data can be off-loaded into the attached disk caching subsystems through fiber-optic connections, thereby freeing up necessary storage space for users to conduct query searches against their databases.

Unisys executives said DataCentral is being targeted at user firms with large customer information systems requirements such as airlines, hotels, banks and retailers.

#### DataCentral's capabilities

DataCentral runs on the DataCentral Operating Environment, a Unisys-created operating system that combines OLTP and query capabilities. The database server can interoperate with any database environment that adheres to X/Open Co.'s Distributed Transaction Processing model or supports Sybase, Inc.'s Open Client/Open Server model.

DataCentral can interface with IBM mainframes, Digital VAXs or Unix-based platforms via IBM's SNA, TCP/IP, Open Systems Interconnect or Fiber Distributed Data Interface links. But for all the snazzy features that DataCentral promises, the system's lofty price tag could be a key stumbling block for prospective custom-

Another problem for non-Unisys customers is one of translation. "It would require some work by MIS to port databases into DataCentral," acknowledged Del Bloss, president of Unisys' Airline Systems division.

#### Gerstner downplays

CONTINUED FROM PAGE 1

sources away from mainframes to client/server technologies. Yet customers "continue to insist that mainframes are critical to their businesses," and IBM has high hopes for its new

CMOS-based System/390 parallel processors.

IBM's failure to capitalize on client/server and distributed computing trends "is the single most important mistake" it has made in the last decade, according to Gerstner.

Corporate users expressed little concern about IBM's commitment to mainframes. "I did not hear [Gerstner] say he's abandoning the mainframe world, just that he's putting more emphasis on client/scrver," said Tom Trainer, vice president and chief information officer at Reebok International Ltd. in Stoughton, Mass.

James Cassell, an analyst at later Gartner Group, Inc. in Stamford, Conn., said IBM will not need to spend as much product plans is the company's "most impormoney on mainframes because CMOS systems cost less to develop and produce.

But users may need more convincing on the merits of the microkernel plan. Tom Loane, vice president of computers and communications services at Alamo Rent a Car, Inc. in Fort Lauderdale, Fla., said he views the microkernel effort "more as [IBM's] cost-containment effort" than something that will provide value.

James Cannavino, lBM's strategy chief, said a 32-bit version of the microkernel will be introduced for OS/2 later this year and expanded to AIX later. A 64-bit version should be ready for implementation with OS/400 during 1996.

As planned [CW, Jan. 17], Gerstner left almost all details to be filled in at later dates on a product-by-product basis. "We're not going to announce them as strategies; we're going to announce them as products," Cannavino said.

IS executives appeared neither surprised nor put off by the lack of detail. "I don't care

> what [Gerstner] says. What we need are real products at real prices, and the jury is still out on that," Loane said.

"I have an old saw that while you're designing the perfect bandage, the patient is bleeding to death," said Tod Dixon, vice president of information resources at Northeast Utilities in Hartford, Conn. Gerstner rightly focused on "stopping the hemorrhaging" at IBM first, not decreeing strategy, Dixon said.

Gerstner vowed to "exploit our technology" better, both for enduser and OEM sales. Changing IBM's corporate culture to emphasize aggressive execution of

tant strategic priority," he said. He also plans to focus the company's "information superhighway" marketing efforts more on businesses than consumers. "I think the business market will arrive first," Gerstner said.

Analysts described Gerstner's comments as a necessary exercise in vagueness. "What he came out with was almost the obvious," Cassell said. "Now they just have to get stuff out on the street and sell some of it."

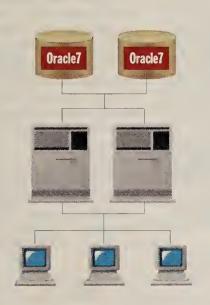
Ed Scannell and Thomas Hoffman contributed to this article.



Vision now, delaits

## Oracle7 Parallel Server: Breaking the Single Server Limit.

Applications built using a first-generation client/server database cannot access data on more than one server computer without a lot of extra programming. In contrast, the Oracle7 Parallel Server database enables applications to access data on multiple server computers just as if all the data was stored on a single server. Which is one reason why 9 out of the top 10 Fortune 500 companies run Oracle7 on their parallel systems.

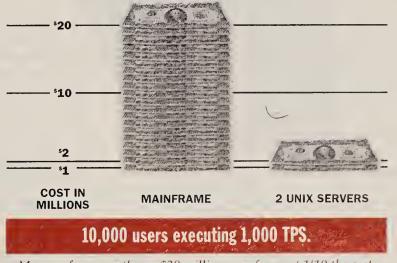


#### **Speed and Scalability**

Performance is increased simply by adding another server. Two UNIX servers running Oracle7 were independently certified as supporting 10,000 users running 1,000 TPC-A transactions per second.

#### **Reduced Cost**

UNIX computers running Oracle7 Parallel Server support more users and more transactions per second than a mainframe. The cost savings are enormous.



More performance than a \$20 million mainframe at 1/10 the cost.



#### Reliability

Parallel servers offer high reliability because there is no single point of failure. If one server goes down, Oracle7 allows other server(s) to continue running your application.

Faster, more affordable, and reliable. Oracle7 offers you a comprehensive client/server database solution for any architecture - SMP, clusters, or Massively Parallel. Call to receive the White Paper "Parallel Database: Architectures for scalable performance". 1-800-633-1071 Ext. 8133.



#### News Shorts

#### AMR consolidates Sabre groups

AMR Corp. has created an umbrella organization called Sabre Decision Technologies that includes its American Airlines Decision Technologies, Sabre Development Services and the Transportation Automation Services unit of AMR Information Services. The unit will employ more than 3,000 staffers and result in an undisclosed amount of staff downsizing, particularly in redundant areas such as customer and help desk services.

#### Novell to build Global MHS into NetWare

Novell, Inc. plans to incorporate Global Message Handling Service (MHS) and directory components into NetWare 4.1, which is due to ship in the fourth quarter, Novell product line manager Ron Cully said last week. NetWare Directory Services (NDS) will become the single directory for both NetWare 4.1 and messaging services. It is also the preliminary step to phasing out Global MHS as a separate product, although users will still have to buy Global MHS for a year or so to get gateways to other messaging systems, such as X.400, Simple Mail Transfer Protocol and IBM's SNA Distribution Services, Cully said.

#### CSC closes with British Aerospace

Computer Sciences Corp. late last week said it closed its outsourcing deal with British Aerospace. The final deal included some adjustments over the arrangements announced last fall [CW, Nov. 22, 1993]. CSC will hire about 1,500 British Aerospace workers; it originally intended to hire 1,250. The value of the contract has increased from \$1.35 billion to \$1.5 billion. The contract, which takes hold April 1, includes CSC support of British Aerospace's troubled AVRO eivil aircraft division. AVRO was not part of the preliminary agreement.

#### CD-ROM patent overturned

A controversial patent awarded last summer to Compton's New Media, a Tribune Co. unit, was overtuned by the U.S. Patent and Trademark Office last week. The patent, which covered a common technique for recording multimedia to CD-ROM, was jointly held by Compton's and Encyclopaedia Britannica, which sold Compton's to Tribune Co. last September. Tribune has 60 days to appeal the decision or file a narrower patent, a company spokesman said. The original patent award last August prompted howls of protest from software developers, who faced having to license the recording technique from Comp-

#### Unisys adds to SMP line

Unisys Corp. introduced a line of Unix-based symmetrical multiprocessing servers designed to handle high-volume on-line transaction processing applications. The U 6000/500 servers, which run on the Unisys Unix System V Release 4/MP operating system, are equipped with Intel Corp. Pentium processors. Adual 60-MHz Pentium configuration, available now with a version scalable up to five Pentium processors, will begin shipping in the second quarter. Prices will range from \$15,000 to \$100,000.

SHORTTAKES Rockwell International Corp.'s Space Systems Division outsourced data processing to Software Maintenance Specialists in Santa Ana, Calif., in a two-year deal with a third-year option that values the contract at about \$12 million.... Delrina Corp. introduced a PC fax "mailbox" service that receives and stores faxes.

More news shorts, page 16

### Remote sites aid data recovery

By Craig Stedman ATLANTA

■ Heightened interest in disaster recovery capabilities is pushing some information systems organizations to buck the data center consolidation trend and open remote facilities that can handle some production systems work while also serving as internal hot

At the Association for Computer Operations Management (AFCOM) spring conference here last week, data center managers said the remote facilities should allow easier and faster recoveries from outages at their main data centers than through external hot sites alone.

"You can have real live recovery," noted Jeffrey Szymanski, manager of computer operations at the Presbyterian-University Hospital of Pittsburgh. "We won't have to build our database again if a disaster occurs because the data will already be" at the remote data center.

The hospital, which is affiliated with the University of Pittsburgh, plans to split its Digital Equipment Corp. systems between its data center and a new facility targeted for completion by March 1996, Szymanski said. Dual shadowing of disk

drives would be used to copy data to both locations.

The remote data center would be run "completely lights-out," with all control and tape backup activities managed from the main site, Szymanski said. The hospital will continue to rely on the university's data center for disaster recovery on its IBM mainframes.

The Federal National Mortgage Association (Fannie Mae) in Washington has an external hot site contract with IBM. However, operations manager Robert Bilodeau said Fannie Mae is also outfitting a remote data center to house an air-cooled ES/9000 that could provide fast recovery for some of its key applications. Those applications "have to come up within a halfhour" of an outage, Bilodeau noted.

Nova Corp., a natural gas company based in Calgary, Alberta, consolidated its Digital-based pipeline systems into its mainframe data center in 1992. But Brian Brookbanks, team leader for computer operations and planning, said the company is considering

> moving some of its mainframe operations to an unattended remote site as part of a disaster recovery project.

#### Real disaster

Unattended remote data centers are becoming "a major reality for people now," both as a growth path and for disaster recovery purposes, said Arnold Farber, principal at Farber/LaChance, Inc., a data center automation consultancy in

Richmond, Va.

#### Hot sites alluring but costly

"All the eggs are in one basket now," Brookbanks said, noting that disaster recovery has become a much higher priority with Nova's management. The company will also consider an external hot site arrangement, but Brookbanks said he sees a need to build redundancy inhouse in order to "provide as high a level of service as I'm used to."

Other data center managers said remote internal hot sites are alluring but costly. "It makes a lot of sense, but it's expensive," said William Townsend, manager of the computer services organization at Air Products and Chemicals,

Inc. in Allentown, Pa.

Summit Information Systems, Inc., the IS subsidiary of Roadway Services, Inc. in Akron, Ohio, evaluates the need for an internal hot site each year after testing its external arrangement with Comdisco, Inc. But Stephen Buckus, manager of computer operations for Summit, said Comdisco's recovery time of 24 to 36 hours remains good enough for Roadway's busi-

#### **Utilities**

CONTINUED FROM PAGE 1

utilities have not had much competition," said David Miller, senior vice president of corporate services at Florida Power. "But competition is coming quickly. Technology can help us deal with that."

#### A reason to redo

Adjusting to a new environment in which energy customers will be able to choose the best prices from multiple suppliers dominated the International Utilities Executive Conference/94 held last week in Amelia Island, Fla.

Speaker after speaker at the three-day event sponsored by Andersen Consulting urged senior executives to exploit technology to protect current business and branch into new areas, including telephone service and offerings on the information superhighway.

"Utilities have a chance once every 20 years to redo their technology," said Brad Holcombe, a partner at Andersen Consulting. "This is it."

That thought is not lost on Entergy, Florida Power or PG&E.

While Entergy officials were not available to elaborate, a Sun spokesman said the 2.3 millioncustomer utility will initially deploy nine SPARCcenter 2000 data center servers and six SPARCserv-

er 1000 systems. TCP/IP and Network File System (NFS) will be standard networking protocols.

Florida Power, a \$1.7 billion investorowned firm, said it replaced an IBM SNA network and 150 Novell, Inc. LANs with private 50M bit/sec. lines with T1 spurs linking TCP/IP networks from HP.

The new system will use Unix servers from HP and run Oracle Corp. databases linked to an IBM ES/9000 Model 820

host, according to Don Higgins, manager of technical services at Florida Power. The last of 3,000 Dell Computer Corp. PCs for eustomer service and administrative users will be operational in January, Higgins said.

The utility serves 1.2 million cus-

tomers in central and northern Florida.

Florida Power is also due to get a new director of information services. Terry Tyler, an executive at Texas Utilities Co., will take over

> on April 4. Higgins has been acting director.

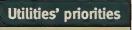
The PG&E project, which began three months ago, will employ Sun workstations and Sybase, Inc. databases, said Leo Conner, manager of PG&E's customer information systems department.

The current system, which uses an IBM mainframe and dumb terminals, handies 250,000 bills and nearly 1 million calls a month, Conner said.

"But there's a big risk if it goes down be-

cause it could take three or four days to get back up," he said. "The overall strategic intent is to get off the mainframe and allow the system to change as rapidly as the business."

Midwest bureau chief Ellis Booker contributed to this story.



#### The top technologies:

- Client/server
- LANs/WANs
- Geographic information systems

#### Most important focus:

- Customer service
- Systems development Purchasing/Sourcing



Source: CSC Index, Inc., Cambridge, Mass.

## Communicate At Breakthrough Speeds.



## Get AT&T's SYSTIMAX® Structured Cabling Systems, And Get Speeds Beyond 100 Mbps.

Over copper. Or fiber. Your network can now have unprecedented speed and interoperability. All by installing AT&T's SYSTIMAX Structured Cabling Systems, with our HIGH-5<sup>TM</sup> product family of Category 5 components. They support today's network applications and emerging technologies like ATM, up to speeds of 155 Mbps. And this total solution offers you end-to-end connectivity maximum network compatibility and the ability to evolve your network as your future needs change. All from a single,

reliable source. AT&T's HIGH-5 products exceed EIA-568 Category 5 specifications, and every certified installation includes AT&T's 15-year extended product warranty. The copper cabling was created by AT&T Bell Laboratories and has become the benchmark for Category 5 standardization testing. So find out how AT&T's SYSTIMAX Structured Cabling Systems can help you break through communications barriers. Call us at: 1 800 344-0223, ext. 3013. Outside the U.S.: 602 233-5855.

AT&T Network Systems And Bell Laboratories. Technologies For The Real World.



#### **Xerox signs EDS**

CONTINUED FROM PAGE 1

\$14.6 billion in its most recent fiscal year. While the company recorded a loss of \$813 million after restructuring writedowns, analysts view Xerox as a healthy company that has successfully shed noncore businesses to focus on the document business.

Although Xerox is not the first eompany to outsource in good times, "they're such a glaring, huge example of a healthy company doing it that this is going to get the attention of others," said Steve McClellan, an analyst at Merrill Lynch & Co.

Xerox Chief Information Officer Patricia Wallington refused to provide any details until the deal is signed.

A Xerox spokesman said that although the company expects to "achieve considerable savings," it was motivated to outsource by other reasons as well: to speed the rate at which it can move to new technologies and to free management to focus on strategic information management issues instead of on day-to-day concerns.

Analysts said they expect that \$40 billion chemical giant Du Pont Co. may be next. Du Pont officials could not be reached for comment, however.

Xerox and EDS said they will discuss specifics after the agreement is signed,

which Xerox said should be by June or July.

The Xerox spokesman said EDS will take over data center operations, worldwide voice and data communications, desktop system support and legacy software sup-



Xerox CIO Patricia Wallington: Declined to discuss details

port. Xerox will retain control over "information management functions that focus on strategy, architecture and new application development to support business process re-engineering."

An EDS spokesman said the outsourcer will also undertake new client/server projects for Xerox. Susan Scrupski, editor of "The Integrator," a Barnegat, N.J.-based newsletter, said she expects EDS' involvement in visible client/server work will help the company shed its mainframe image.

#### **Minority untouched**

About 2,000 of Xerox's 2,700 information systems staffers will be affected by the outsourcing contract. The other 700 are involved in architecture, strategy and application development, according to the Xerox spokesman.

While many of the 2,000 will transfer to EDS, some will be subject to work force

#### Behind the scenes

EDS, ISSC and CSC each spent more than \$1 million vying for the Xerox job, said The Yankee Group managing director Howard Anderson.

EDS will take over Xerox data centers in Rochester, N.Y., the UK and Brazil.

One source said IBM Chairman Louis V. Gerstner was prepared to sell IBM's printer division, Pennant Systems, because it competes with Xerox and therefore hurt ISSC's chances of winning the deal. reductions as part of Xerox's ongoing corporate plan to cut its 100,000-person work force to 90,000 by 1996, the spokesman said.

The Xerox spokesman did not elaborate on why the company chose EDS over IBM's Integrated Systems Solutions Corp. That Xerox chosc EDS over ISSC bears the mark of IBM Chairman Louis V. Gerstner on its outsoureing practiec: Where not long ago ISSC might have margins to win

the job, this time it opted to protect its bottom line, analysts said.

Analysts added they were impressed with the alacrity of Xerox's outsourcing evaluation. The company began a feasibility study six months ago. Evaluations can drag on for well over a year.

"They've moved so fast because they don't want their people on pins and necdles," said William Rabin, an analyst at J. P. Morgan Sceurities, Inc.

#### The wait is over.

Now you can get everything you need for client/server computing from a single source. It's faster, easier, smarter. It's SAP Special Delivery.

#### Seeing is believing.

No more time wasted in long evaluation cycles, researching hardware platforms, interviewing consultants, haggling over prices. We've put together an uncompromising combination of client/server financial applications software, hardware, implementation and support . . . so you don't have to.

#### Saving, not spending.

Not only will you save months of research and evaluation time, you'll get tangible proof of the benefits of client/server in 30 days.

If you don't like what you see, you don't have to keep it.
But if you do, you can achieve production in another 120 days. It's
just what you'd expect from the world's leader in client/server technology.

#### The timing is right.

With SAP Special Delivery, you'll be running your business on client/server while your competition is still evaluating its options.

## Special Delivery Client/Server.

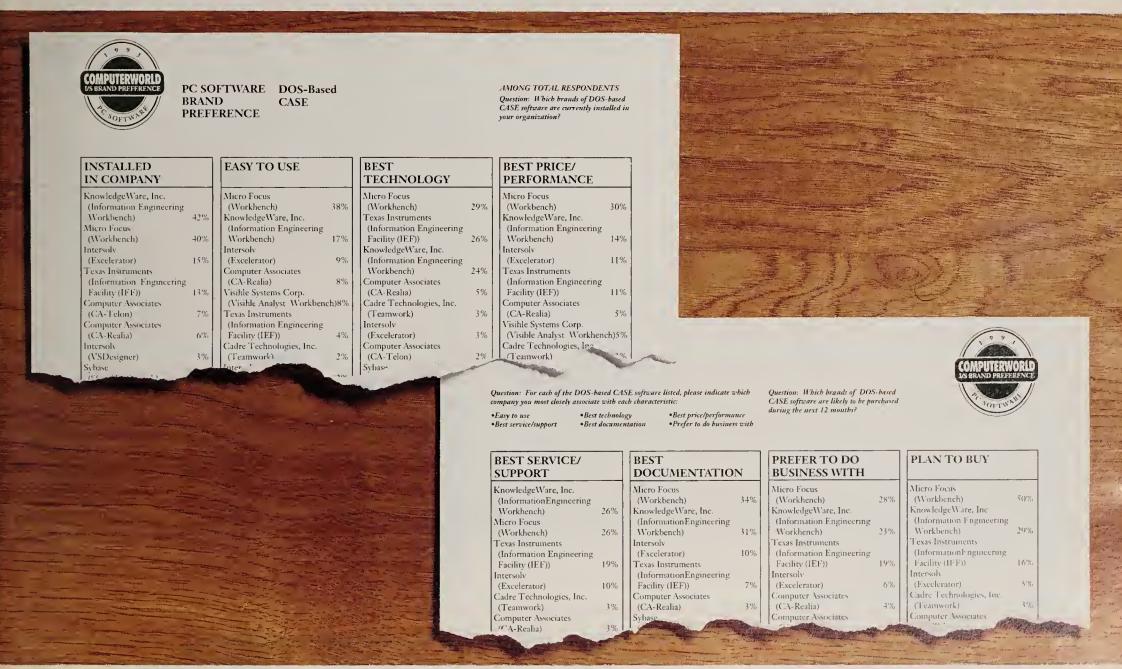
All you add is the enterprise.

Call today to find out if you qualify for SAP Special Delivery.

1-800-205-1272



## We didn't say COBOL Workbench is the best in the world. You did.



Workbench® is the best in the world. Now you've confirmed it by unequivocally placing it first in the

COMPUTERWORLD

1993 Computerworld PC Software Brand Preference survey.

You voted COBOL Workbench as Best Technology and Easy to Use.

That's not all. Workbench has also won top honors in Price/Performance, Best Documentation, Plan to

We've always believed Micro Focus COBOL Buy, and most importantly, you chose Micro Focus as the company you Prefer to do Business With According to you there was no contest.

> Not surprising really. There is no better technology for developing new systems or re-engineering existing applications on the workstation. Programmers find Workbench puts them directly in control of their development environment, delivering quality business applications on time and on budget.

If it isn't Micro Focus COBOL Workbench, it isn't in the running. That's not just our opinion, it's yours. COMPUTERWORLD

For your free copy of the 1993 Computerworld survey, or for more

information, call 800-MF-COBOL, (800-872-6265).



## Not everyone beaming at satellite net project

By Michael Fitzgerald and Ellis Booker

Teledesic Corp.'s \$9 billion scheme to ring the globe with a broadband satellite network, announced last week, is the latest in a series of

efforts that purport to let businesses communicate in any crevice, cove or cockpit in the world.

Its 10-year time frame and high cost drew a chorus of skepticism from users and analysts, who were not convinced that Teledesic, and big-name backers Bill Gates and Craig McCaw, isn't just Michael Jordan in baseball cleats. But users and analysts said that over time, at least one of these satellite networks will be a success.

"The trend right now is to eradicate phone lines, so eventually with that type of satellite technology you'd eliminate telecom lines altogether," said Justin Alexander, manager of advanced technology at SmithKline Beecham, Inc.

in Philadelphia. Alexander said that in Teledesic's favor is its planned use of Asynchronous Transfer Mode (ATM) fast-packet switching in its backbone. This would map to SmithKline's notion of using ATM as a backbone for its complex.

Still, critics noted major technological, busi-

Still, critics noted major technological, business and regulatory hurdles that Teledesic's 840-satellite network must clear to be opera-

tional by 2001. Even some current users of satellite networks were not impressed with Teledesic's grand designs. Target Stores, Inc. in Minneapolis has used the Hughes Corp. satellite network for seven years for data transmissions to stores. But Teledesic sparked little more from system architectural planner Steven Flemming than a grudging concession that "we might have some curiosity" about it.

Dave Beering, staff telecommunications analyst at Amoco Corp. in Chicago, called the Teledesic concept "interesting" but said he will

wait to see which projects actually get off the ground. Amoco has an ATM pilot under way.



Billionaire Bill Gates put his own money behind the joint venture

#### LAN in space

The proposed Teledesic Network system takes its architectural notions from the Star Wars "brilliant pebbles" space defense program, which called for many interlinked, low-flying satellites.

As such, it will use 840 interlinked low-Earth orbit geostationary satellites hundreds more than any existing or planned satellite-based communications network.

Teledesic said it does not intend to market the service to end users. Instead, it will make the infrastructure available to local telephone companies and government telecommunications agencies, which will use it to "modernize existing communications systems and bring affordable access to rural and remote locations," the company said.

The meshed network will support channels ranging in speed from 16K bit/sec. to 2.048M bit/sec., as well as a smaller number of 155M bit/sec. and 1.244G byte/sec. channels for special applications.

The network will be based on fast-packet switching using the ATM protocol and will operate in the 30/20 GHz Ka band for fixed satellite service.

Targeted to be in operation by 2001, the satellite network will support 2 million simultaneous, full-duplex 16K bit/sec. connections and cover 95% of the Earth's surface, Teledesic claimed.

—Ellis Booker

#### Fate unknown

Obscrvers noted that all the satellite initiatives under way require huge capital investments and multinational cooperation. While Teledesic is talking the biggest game, other projects, both less costly and less sweeping in scope, could either suffer a dark fate or make Teledesic scem like an afterthought. Four other ventures are already in the works, the most-publicized being Motorola, Inc.'s Iridium network, a \$3.4 billion venture that has garnered \$1.1 billion in financing in its four years of existence.

However, analysts noted that traditional carriers, cellular carriers, governments and even players such as cable companies are aggressively deploying sophisticated, fiber-optic-based systems, which may greatly reduce the need for satellite-based systems.

Teledesic President Russell Daggatt said demand for broadband services such as telemedicine or videoconferencing already outstrips the abilities of most phone networks. By targeting institutions, not individuals, Teledesic expects to find a market.

## satellites and be based on Asynchronous Transfer Mode. The three types of users are as follows: SATELLITES Remote user. Individual standard terminal for voice, data and low-resolution video (16K bit/sec.) Remote user. Individual standard terminal for voice, data and low-resolution video (16K bit/sec.) Remote institutional user for voice, data and image (above 2.048G bit/sec.)

Flight of fancy

The Teledesic network will use 840 interlinked low-Earth orbit geostationary

#### Microsoft invests \$30M in Mtel

Microsoft took an equity stake in Mobile Telecommunication Technologies Corp. (Mtel) last week. Microsoft invested \$30 million in Mtel's Nationwide Wireless Network (NWN), giving it an 8.5% stake in the Jackson, Miss., wireless network vendor. Mtel is best known for its SkyTel paging network. NWN is not scheduled to be operational until late 1995. The funding follows a recent investment by Microsoft in Metricom, Inc., which makes campus-type wireless networks. A Microsoft official said it is working with these types of firms to better understand the market for wireless computing and how to develop software for those areas.

 $-{\it Michael Fitzgerald}$ 

The big question is how a company, or consortium of companies, might profit from this type of service. Motorola's tack with Iridium has been to position it as a premium-priced, premium service means of portable communications. Teledesic will target fixed sites and will charge customers roughly what they would pay for land-line services in major urban areas.

#### **Complementary method**

John Pemberton, co-founder of the Pemberton Group in Marshfield, Mass., said the proposed Teledesic system would complement, not replace, terrestrial fiber optics.

Even so, several observers noted the complications of obtaining space rights for satellites.

For example, after four years, Motorola's lridium has yet to obtain a license from the Federal Communications Commission to build its system. A spokesman said it does not expect a license until late 1994 or early 1995.

Despite these obstacles, the influence of McCaw, chairman of McCaw Cellular Communications, Inc., and Gates, chairman of Microsoft Corp., gives Teledesic, a 3-year-old start-up formerly known as Calling Communications Corp., a lot of sway.

"I give a higher probability of success to Craig and Bill pulling this together than to anyone else," said Mark Eppley, chairman and chief executive officer at Traveling Software, Inc. in Bothell, Wash.

Eppley added that the economic model of setting up a worldwide phone company was changing, thanks to technological innovations. "So while it might look like [they're] putting a \$5 bet on the Cubs going to the World Series, it's not as wide-eyed as people think."

#### Communications technology in ORBit

evelopers working on the lridium project at Motorola are expected to bring in object-oriented technology to coordinate satellite-to-ground station communications and communications on the ground, according to industry sources.

The Orbix technology from Iona Technologies Ltd. in Dublin is an object request broker (ORB) that complies with the Object Management Group's Common Object Request Broker Architecture (CORBA) and lets communications occur consistently among programs, the sources said.

For example, Orbix will establish a protocol that will allow objects to be shared between satellites and the base station.

lona officials refused to comment. David Castillo, Motorola's lead software engineer for Iridium's systems control segment, would not give specific product details. He said, however, that "we've looked at a CORBA for our nerve center and are evaluating a number of ORBs, including lona's. Our software will manage the health and status of the network, and the infrastructure will be CORBA-based."

An announcement about Iridium's use of Iona is expected within the next two weeks, the sources said.

-Melinda-Carol Ballou



WorldCupUSA94

## replication server replication

The first distributed system

## replication

that allows organizations to share and synchronize data among multiple sites,

despite system failure.

Now, there's no need to base business decisions on outdated information. No need to let system disruptions halt transaction processing. No need to invest time and money inventing a distributed system of your own.

Sybase introduces Replication Server. The first software product that allows distribution of business-critical data to everyone who needs it – and synchronizes that data at all sites – even in the event of a network failure.

Replication Server is a key component of the first complete solution for enterprise client/server computing: SYBASE® System 10.™ And like every Sybase product, it's backed by a world-class service and support organization.

For a free copy of the Patricia Seybold Group report on "Replication," call 1-800-SYBASE-1, extension 5010, today.



#### Fruits of labor

The first fruits of Novell's proposed buyout of WordPerfect will be a comprehensive workflow/workgroup offering. It will be pitted against Lotus' Notes and upcoming Lotus Communications Server (LCS), as well as Microsoft's upcoming Enterprise Messaging Server, which is expected this summer.

Novell's Group Ware, which is expected to be officially an-

nounced this week, will combine Novell network services with WordPerfect's Office, InForms and SoftSolutions Document Management System, Novell said in a white paper released last week.



#### Messaging

The product will offer electronic messaging, calendaring, scheduling, document management, groupware and workflow applications, as well as remote server access, messaging, cellular, fax and paging connections for mobile users. Novell will supply the underlying enterprise services, such as Net-Ware Directory Services (NDS). as a common global directory for the applications.

The suite will run on Unix, OS/2 and Microsoft's Windows NT servers in addition to Net-Ware and will support a range

of client systems. Open application programming interfaces (API) will be available to thirdparty developers to tic in their applications. Rollout should begin in approximately one year, a Novell spokesman said.

However, the vendors said they are just starting to hammer out a plan for merging the best of their respective messaging products into a comprehen-

sive messaging engine that will be a piece of their workgroup/workflow architecture.

#### Linking

Preliminary steps, expected by year's end, will include links between WordPerfect's Of-

fice and Novell's NDS and Global Message Handling System.

Also in the works are APIs and AppWare Loadable Modules that will enable developers to hook their applications into a messaging platform that combines Novell's message routing and WordPerfect's message storage system, said Robert Davis, Novell's senior vice president of corporate marketing.

One source said Lotus would be tying its forthcoming LCS into NDS. If true, users would no longer have to maintain separate networking and messaging directories.

—Elisabeth Horwilt

#### **Novell**

CONTINUED FROM PAGE 1

"I hope they put together the best of both companies rather than the worst," said Gary Wilkerson, supervisor of end-user services at health care provider Kaiser Permanente in At-

Despite these concerns, many customers said Novell's vow to deliver bulletproof networked applications sounds promising. They also lauded the idea of consolidated network

and desktop application support.

And with WordPerfect's profits slumping because of the popularity of desktop applications from Microsoft Corp. and Lo-Development Corp., some customers said the Novell purchase at least reassures them that WordPerfect's products will be around for a while.

"It could improve WordPerfect's compatibility with Novell [NetWare] and give us one number to call for help," said Ron Stauss, manager of developsystems ment at Rust Engi-

neering Co. in Birmingham, Ala.

What will happen probably will not be clear until June, when the merger is expected to be completed. The agreement detailed last week has Novell acquiring WordPerfect and the Borland spreadsheet. WordPerfect would become a wholly owned subsidiary headed by WordPerfect Chief Executive Officer Ad Rietveld. It would focus on group communications software as well as marketing WordPerfect software and a three-product application suite called Borland Office that Borland markets.

With the merger, several management issues will step to the fore. Given that Rietveld has spent but two months at WordPerfect, and Novell President and CEO Ray Noorda is slated to step down in June, the question of who will head up the combined firm hangs heavy.

Wall Street, along with some analysts, were at best skeptical about the merger. Many observers suggested Novell overpaid for Word-Perfect, which acknowledged it had been in concurrent discussions with Lotus.

"Novell is eating something larger than its

head. They are investing in too many companies and not doing enough" with the ones they have, said Heidi Dix, a software strategy analsyst at Forrester Reseach, Inc. Cambridge, Mass.

Beyond financial issues are concerns about whether they show a real synergy in their product lines.

Novell plans to introduce workgroup and workflow applications within a year that combine its Net-Ware directory and message-routing strengths with Word-Perfect's document processing, message

storage and rules-based document routing technology, said John Edwards, Novell executive vice president.

To its credit, Novell now has the raw tools— NetWare services and WordPerfect LAN products — to cobble together a compelling group computing strategy to compete with Lotus and Microsoft, observers said. Specifically, Novell discussed layering its AppWare development software on top of the Borland Office suite.

#### Comfort level Novell's backing makes users somewhat more comfortable with the WordPerfect/Borland software suite IS YOUR ORGAN-IZATION MORE OR LESS LIKELY TO STAN-DARDIZE ON THE WORDPERFECT/ QUATTRO PRO SUITE NOW THAT NOVELL WILL MARKET IT? LIKELY RESPONSE BASE: 62 Support doubts linger... HOW CAPABLE DO YOU THINK NOVELL IS OF OFFERING ADEQUATE SUPPORT FOR WORDPERFECT AND QUATTRO PRO NOW? ... but users think they will diminish over time How CAPABLE WILL NOVELL BE IN 12 MONTHS? Source: Computerworld Database Division, Framingham, Mass.

## Novell details multiprocessing NetWare vision

Greater

capacity

The first version of

NetWare to support

SMP will off-load

resource-intensive

portions of the

operating system to

dedicated CPUs. This

will give the main CPU

more capacity for

non-SMP NetWare

Loadable Modules and

services. These would

likely be LAN and disk

authentication and

encryption, according

to Novell.

drives, directory

By Elisabeth Horwitt and Jaikumar Vijayan SALT LAKE CITY

Novell, Inc. last week detailed its longterm strategic vision for NetWare, based on a plan to support multiprocessing. When implemented, the plan should enable NetWare users to better run mission-critical applications in a distributed environment.

Novell's four-pliase move to multiprocessing includes the following:

- Symmetrical multiprocessing (SMP) support by year's end for NetWare 4.x.
- · Nonsymmetrical multiprocessing-capable NetWare Loadable Modules that will run under SMP NetWare via dedicated central processing units. These will ship m 1995.
- Platform-independent multiprocessing by year-end 1997. Asymmetrical multiprocessing and clustering supportenabled NetWare will be available in this third phase.

• In the final phase, multiprocessing Net- be broadly useful. Ware will be available across processor-

independent platforms including those Hewlett-Packard Co., Sun Microsystems, Inc., Digital Equipment Corp., Compaq Computer Corp., Tricord Systems, Inc. and NetFrame Systems.

#### Joining together

Concurrently, Novell will move UnixWare and Net-Ware to the same software microkernel. Novell hopes to combine the best features of the two systems, according to chief scientist Drew Major.

Users said they were pleased with the plan but pointed out that multiprocessing still lacks the essential components needed to

"What's needed right now are applica-

tions that use the technology," said Michael Stonecioffice pher, systems manager at United Missouri Bank in Kansas City.

Still, some users were unimpressed.

"So far, all the talk about distributed processing in the LAN environment has been just smoke and mirrors," said Marshall Fernholz, network control manager at the American Medical Association in Chicago. "Vendors have still not been able to get the handshaking accomplished between different product lines."

The move to SMP flies in the face of recent corporate statements that Novell had

no serious plans for this technology [CW, Sept. 20, 1993]. Analysts said the announcement, made at last week's Brainshare developer conference, would help Novell make up lost ground in the multiprocessing market.

#### Playing catch-up

"The SMP announcement is Novell's way of catching up to Unix and NT," said Clare Garry, senior analyst at New Science Associates, Inc., a division of Gartner Group, Inc.

Novell also announced the addition of server vendor Tricord as its latest multiprocessing hardware partner.

Tricord will provide expertise and its PowerFrame SMP servers to assist Novell in the development of the SMP-enabled NetWare, according to Mark -Garver, Tricord's vice president of corporate strategy.

Novell is beefing up support of CompuServe forums. See page 61.

#### **Microsoft**

CONTINUED FROM PAGE 1

memo marked confidential and dated Dec. 31, 1993.

The goal is to establish Object Linking and Embedding (OLE) as the standard for "document-centric" computing. Microsoft intends to freeze out Novell by combining distributed OLE capabilities with a file system designed to quickly store and retrieve objects in Cairo, a ma-

> jor version of NT Windows due out next year.

The memo notes that "Cairo... contains a silver bullet against Novell, changing the game in file serving.

"This means storing OLE embeddings, finding documents, etc., must work dramatically better in our environment than in Novell's," Allchin explained in the memo.

While Rich Tong, director of Windows NT marketing in the business systems di-

#### **Acquisitions smell** of suite success

By Ed Scannell and Lynda Radosevich

The rapid pace of consolidation among PC software companies will fuel the drive toward suite sales and may push users to form groups to more effectively lobby for their interests.

Novell, Inc.'s acquisition last week of WordPerfeet Corp.'s and Borland International, Inc.'s spreadsheet businesses is just the latest example of how the microcomputer software business is becoming a caste society made up of billiondollar superpowers and cottage-industry-size developers.

The upshot is that users will have fewer — albeit more integrated — packages from which to choose.

"User groups already are becoming more powerful and will become more so to make sure that the products we invest time and money in remain viable and aren't pushed out of the marketplace by mergers or battles between software giants," said Frank DeVito, manager of information systems at Rogers & Wells, a large New York law firm.

The greatly reduced purchase price of suites "probably will force our hands," agreed Eddie Whinecoff, manager of systems programming at Doran Textile, Inc. in Shelby, N.C. "If you can get all of [the applications] for the same price [as one], well, price is usually our first criteria."

However, analysts said customers should also realize it will be at least a year before Novell becomes a viable eompetitor to Microsoft Corp. and Lotus Development Corp. in the desktop application and groupware areas.

vision, would not confirm the existence of the memo, he said that the basic strategy is not a secret.

Microsoft plans for NT and the server applications to account for \$1.5 billion in sales by fiscal 1998, up from \$100 million to \$200 million in fiscal 1993, according to the memo.

"Over time, we will be lowering NT's price, and (sooner rather than later) we will be raising NT [Advanced Server's] price" for larger environments, the memo states. Tong said NT is "definitely on a penetration pricing scheme."

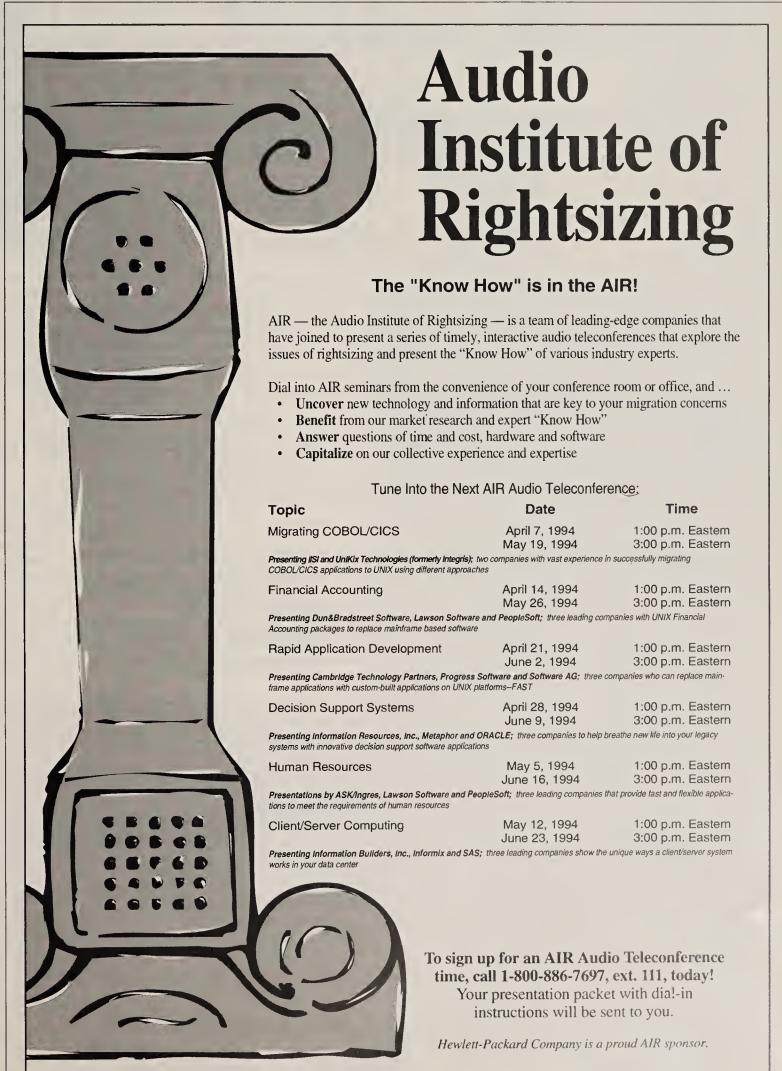
#### Daytona will deliver

Meanwhile, the first major salvo in the object battle will come next quarter when Microsoft ships Daytona, an interim update of Windows NT and NT Advanced Server.

Daytona will require less memory, run faster and supply better support for other networks such as Novell's NetWare and TCP/IP.

"Customers already have installed systems. Immediately adding value to this environment makes us the perfect Trojan horse," the memo states.

But making NT ubiquitous while also reaping huge profits will be tricky: Microsoft will have to reassure its customers that the move will be smooth. If users wait until Cairo arrives, the change may be too abrupt to tempt them over the



#### News Shorts

#### Compaq to include Stacker 4.0

Stae Electronies last week said Compaq Computer Corp. will ship its Stacker 4.0 disk compression utility preinstalled on Compaq desktop and portable computers. Compaq currently has the version of Stacker 4.0 that contains the DOS preload feature that was the subject of a successful Microsoft theft-of-trade-secrets verdict against Stac last month. However, the computer manufacturer said it also has a "nonpreload" version that it can ship if Microsoft gains an injunction to halt shipment of the preloading code.

#### Sun to complete overhaul

Sun Microsystems, Ine. is expected to complete a makeover of its workstation line this week with the unveiling of low-end and midrange workstations. The SPARCstation 5, based on 70-MHz and 85-MHz versions of MicroSPARC II chips from Fujitsu Ltd., will be priced from \$3,995 and \$11,395. The new models are to replace older SPARCstation LX machines as Sun reprices its entry-level SPARCclassic machine at \$2,995. The new SPARCstation 20, based on Super-SPARC chips running at 50 MHz and 60 MHz, is priced from \$12,195, Sun said.

#### AIX 4.0 to support multiprocessing

The next release of IBM's AIX operating system will be tailored for IBM's new symmetrical multiprocessing (SMP) Unix machines, due out by summer [CW, Feb. 7]. AIX 4.0 will support multithreaded database applications running on the SMP machines. In the future, it will be tuned to fit desktop PC clients, departmental servers and enterprise servers, said Donna Van Fleet, director of RISC systems software at IBM's RISC System/6000 division. Pricing will be scaled to the processor. AIX 4.0 will also do Windows, using Sun's revamped Wabi interface (see story page 4).

#### JC Penney chief wins award

JC Penney Chairman William R. Howell will receive this year's "Excellence in Technology" award from Gartner Group, Inc. Gartner cited the retail and catalog giant for its use of electronic data interchange (EDI) to boost sales and reduce general and administrative expenses from 30.6% of sales to 28.6%. EDI is used for more than 96% of the company's purchase orders and 84% of its invoices. It also enables JC Penney to provide 1,300 suppliers with a weekly summary of their sales from the previous week.

#### EDS, Bull aid Bosnian refugees

Electronic Data Systems Corp. and Bull HN Information Systems, Inc. have joined technology forces to assist the United Nations in reuniting Bosnian refugee children with their parents. Under Operation re-UNite, EDS is creating a database of refugee profiles supplied by the UN, including photographs. EDS transfers the data to CD-ROMs, which it distributes to UN officials who use Bull portable and desktop boxes at various refugee sites.

SHORT TAKES Banyan Systems, Inc. announced that co-founder Lawrence Floryan is leaving the company to start a high-technology venture... Microsoft Corp. said it will license Windows source code to Locus Computing Corp. and MainSoft Corp. so the two can support Windows applications on popular Unix systems... Computerland Corp. changed its name to Vanstar, Inc. following its \$110 million sale of the Computerland name, franchise and distribution division to Merisel, Inc... Hewlett-Packard Co. is expected to announce a \$40,000 high-performance version of its HP 9000 Model 735 workstation this wook.

## Sybase products remain disjointed

By Kim S. Nash

Sybase, Inc. quietly sent beta copies of its first graphical development tool, Build Momentum, to at least two large customers last month. Meanwhile, ship dates and features remain vague for a repository needed to unite Sybase's disparate application development tools even though the company outlined plans for it seven months ago.

Though details were scant at the time, a repository is key to fully integrating the products because it would serve as a weigh station of sorts for new and existing applications created with it.

However, in its first release, due out early next year, the repository will not integrate Sybase's tool collection, said Bill Smith, senior product marketing manager for Enterprise Momentum.

"In August, we [showed] a diagram that laid out the completed vision for Enterprise, integrating Gain and Build applications, but that's not for a while yet," Smith said. Enterprise 1.0 will contain various data and business process modeling tools only, he said.

Sybase's so-called Momentum strategy, a banner under which old and new graphical and characterbased development tools would be integrated, consists of the following:

•Gain Momentum, a multimedia kit acquired from

Gain Technology, Inc. 18 months ago.
• Build Momentum, a

graphical tool set for building Windows-based software and converting character-based programs built with APT Workbench.
•Enterprise Momentum, a set of data and process modelers to be managed by an overarching repository that would unite all Sybase tools.

#### **Need for direction**

Sybase must address the lack of a repository soon, said Herb Edelstein, an analyst at Euclid Associates in Potomac, Md. "Otherwise, users will have a hard time understanding what to do with all those tools and how they fit together."

Still, Sybase's efforts may not overcome a problem endemic to many repositories, Edelstein said, noting that they tend to be vendorspecific. "That can be limiting if people think moving to client/server means freedom from homoge-

neity."

**Traditional CASE** 

yendors,

including

Bachman

Information

Systems, Inc.

and LBMS, Inc.,

are helping

Sybase build

links from its

repository to

their CASE tools,

a Sybase official

said.

Meanwhile, Build Momentum — Sybase's answer to Powersoft Corp.'s Power-Builder client/server tool kit - is in use at Avalon Software, Inc. and Hill Arts & Entertainment, Inc. The software makers sell programs written in character-based APT Workbench. With significant installed bases in Sybase, both firms want to put graphical interfaces

on their applications.

But until Build Momentum is stable, Avalon will not ship applications written with it, said Doug Souza, head of development. "It's been a slow process, but we're getting there," he said. Avalon expects to have graphical Sybase packages out next quarter.

## Vendors address need for Notes tools

#### Firms line up to offer support

By Melinda-Carol Ballou

opment tools.

Lotus Development Corp.'s Notes has become a hot environment for development tools makers, as evidenced by several products due to hit the streets in the coming months.

While Powersoft, Inc. will ship its PowerBuilder Library for Notes by mid-April, several other companies have or will have products that offer Notes links to IBM's SQL along with a range of devel-

Those companies include Brainstorm Technologies, Inc. in Cambridge, Mass., [CW, Nov. 1, 1993] and Edge Research, Inc. in Portsmouth, N.H.

Notes users need support from tools vendors because current options for Notes development are cumbersome and Lotus has not yet shipped its supposed solution to that problem, Notes VIP tools.

The PowerBuilder Library for Notes lets developers connect SQL data with Notes and incorporate Notes data directly into PowerBuilder applications, according to Bill Critch, Powersoft's director of business and alliance programs. Announced at Lotusphere last December, the product was originally slated to ship by the end of the first quarter [CW, Dec. 12, 1993].

#### Power play

The PowerBuilder Library is customized for PowerBuilder and lets developers automatically generate PowerBuilder objects out of Notes forms and data. Those objects can then act as templates for creating PowerBuilder applications, Critch said.

The Brainstorm and Edge Research products, on the other hand, generically support a range of tools, including Microsoft Corp.'s Visual Basic and Gupta Corp.'s SQL Windows.

Both companies use Visual Basic controls, also known as VBXes, to support Notes. Brainstorm's primary product is Visual Basic/Link to Lotus Notes. The company also created Dynamic Link Libraries (DLL)

> for Gupta's SQL Windows, which in turn can make calls to Notes DLLs to let developers easily connect the environments, according to company officials.

#### Edge Research will

Basic addition
Brainstorm currently offers support for
PowerBuilder as well; Edge Research
will ship its product for Visual Basic next
month and is expected to provide PowerBuilder support by the summer.

In addition to the VBX controls, Edge Research has built a new application programming interface for Notes that lets developers create C calls to Notes from Visual Basic.

Separately, Gupta officials said they will ship their own support for Notes by the summer with a new version of their SQL Windows tools.

PowerBuilder Library for Lotus Notes is priced at \$295 for use in conjunction with Enterprise PowerBuilder, which is priced at \$3,395, or with PowerBuilder Desktop, which will be priced at \$695 starting next month.

#### Unique fact

take an unusual approach to distribution: shipping its product for linking Lotus Notes to Visual Basic on CompuServe and WorldCom, While the initial three copies will be free of charge, a probable pricing scheme is \$20 per copy thereafter, with an initial minimum of 100 copies and a support charge of \$500 per user.

## WHY DO 4000 OF THE WORLD'S LEADING CORPORATIONS DEPEND ON FOCUS FOR ACCURATE REPORTING?

#### INTRODUCING FOCUS REPORTER FOR WINDOWS.

Thousands of successful corporations and government agencies have made FOCUS their standard for missioncritical reporting applications. Why? Because the combination of reliability and efficiency of FOCUS for reporting and decision support has never been equaled. And now Information **Builders is proud to introduce FOCUS** Reporter for Windows™

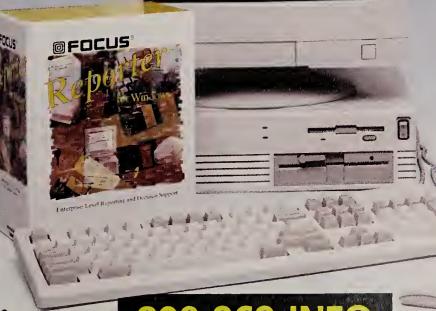
#### **LOOK UNDERNEATH THE GUI** INTERFACE TO FIND THE REAL POWER!

Sure we've got a great-looking object-oriented Report Painter, full 3D graphics, and a fool-proof "Report Assist" mode that makes it easy for novice users to create meaningful reports. But it's underneath the interface where this sensational reporting system packs the real power...the underlying FOCUS language. When banded or SQL-based reporting tools run out of steam, FOCUS Reporter makes it easy to produce almost any report imaginable.

#### BECAUSE THEY CAN RELY ON THE RESULTS.

You can create calculations on the fly for powerful ad hoc analysis...plus format and style your report all in one pass. You even get a full-feature GUI forms painter that makes it easy to build and deploy finished reporting applications for standardization in any operating department.





In Canada call 416-364-2760

#### **RESULTS YOU CAN RELY ON!**

Early Release

Only \$199

imited Time Offer

Underneath the point and click Windows interface, the straightforward English language of FOCUS provides an easy audit path to the source of the numbers in your report, so there's never a question as to how they were derived. And no matter what the application...\$ales, Marketing, Manufacturing, Inventory, Accounts Receivable, Personnel...your results will always be consistent.

#### **UNBEATABLE CLIENT/SERVER** REPORTING ENVIRONMENT.

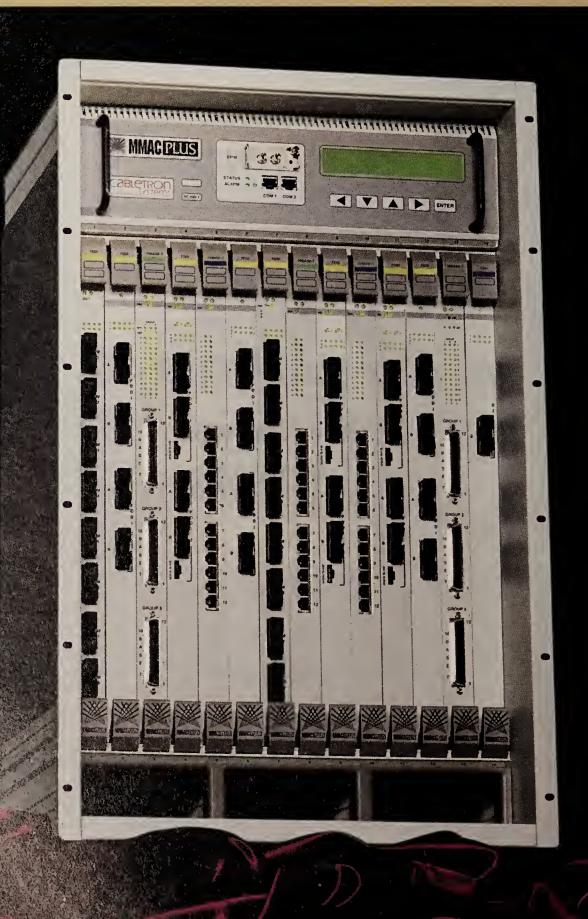
FOCUS Reporter is LAN-ready and offers built-in interfaces to Oracle, Sybase/SQL Server, DB2/2, ODBC, Teradata, FOCUS/Database Server, Btrieve, and other popular database servers. And FOCUS Reporter is enabled with Information Builders own EDA/SQL™ client/server technology, giving you the potential to report off more than 55 relational and nonrelational databases. No other reporting system offers you this level client/server distributed processing.

Find out why FOCUS Reporter for Windows is in a class by itself! For a FREE DEMO DISKETTE, more information, or to attend a free seminar in your area, call 800-969-INFO.

> Information **Builders**

## THE COMPETIT

INTRODUCING THE MMAC-PLUS,™ THE



## ION IS FINISHED

## FIRST TRUE PACKET SWITCHING HUB.

ith the MMAC-Plus, you'll never have to compete for bandwidth again. That's because the MMAC-Plus features integrated switching technology to support both packet-based and ATM cell-based networks. Now you can create dedicated user-per-port LANs that will provide for many classes of service — including E-mail, video conferencing and more — and still guarantee that each user receives the fast, reliable service he or she needs.

Through a unique packet/cell switching backplane and Cabletron's innovative SecureFast™ Packet Switching, the MMAC-Plus delivers the best benefits of ATM technology . . . while preserving your existing investment in Ethernet, Token Ring and FDDI. No other vendor can make that claim.

#### Features include:

- An aggregate bandwidth in excess of 10 Gbps.
- Aggregate switching greater than 5 million packets/cells per second.
- Over 500 ports of connectivity.
- Support for over 160 switched LAN segments and a virtually unlimited number of shared-access LANs.
- Supports mixed Ethernet, Token Ring, FDDI, ATM and WAN connections.
- Supports integrated MAC layer bridging, network layer routing, SecureFast Packet Switching and ATM cell switching.
- Embedded network analysis tools.
- Fully fault tolerant design.



A hub is not just a hub. For more information on the next-generation hub platform that starts where the competition finishes, call (603) 337-2705 for your free, informative white paper, Cabletron's MMAC-Plus: A True Switching Hub.



### IBM continues shift to Ethernet

By Stephen P. Klett Jr.

IBM quietly unveiled its first Ethernet switch last week as part of a networking product rollout consisting mostly of Token Ring hardware (see page 47). Observers said the switch was a harbinger of bigger Ethernet rollouts as IBM continues to shift its focus away from a shrinking Token Ring market.

Analysts said IBM's Token Ring strategy hurt the company by delaying its development of more cost-effective products — such as the Ethernet switch that alleviate bandwidth congestion in shared LAN environments. The switch will be followed by another round of "more glamorous" Ethernet products in

a month or two, according to Tom Nolle, president of consultancy CIMI Corp. in Voorhces, N.J.

IBM's focus on Ethernet does not appear to be a big issue for some large Token Ring sites.

"Long-term Token Ring support is really not an issue unless someone plans to just follow Token Ring as their only

networking architecture, which would be misguided," said Bill Conley, manager of corporate information systems at Loral Aerospace Corp. in Newport Beach,

He said that if he were starting from scratch, he would buy Ethernet because it is the less expensive route.

In fact, price is becoming a major thorn in Token Ring's side. For example, network adapter cards can cost anywhere from \$200 to \$600 more than their Ethernet counterparts. Higher-speed products such as switching hubs and fullduplex adapters also cost two to three times more than comparable Ethernet products. Token Ring's claim to fame has been built-in intelligence and manageability, for which large customers had been willing to pay a premium.

No longer.

Recent research shows that the Token Ring market has experienced two straight quarters of decline, which is expected to continue throughout this year (see chart), while Ethernet is experiencing phenomenal growth. According to analysts and users, more and more remote sites are bringing in Ethernet to integrate their SNA and corporate LANs be-

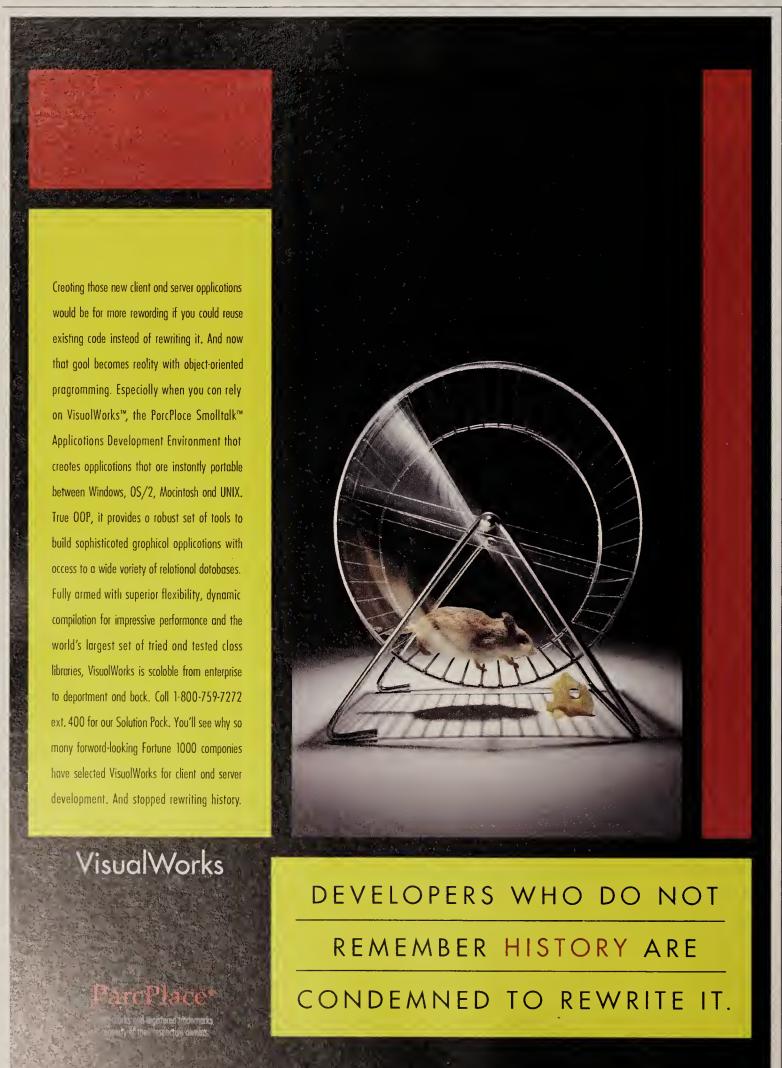


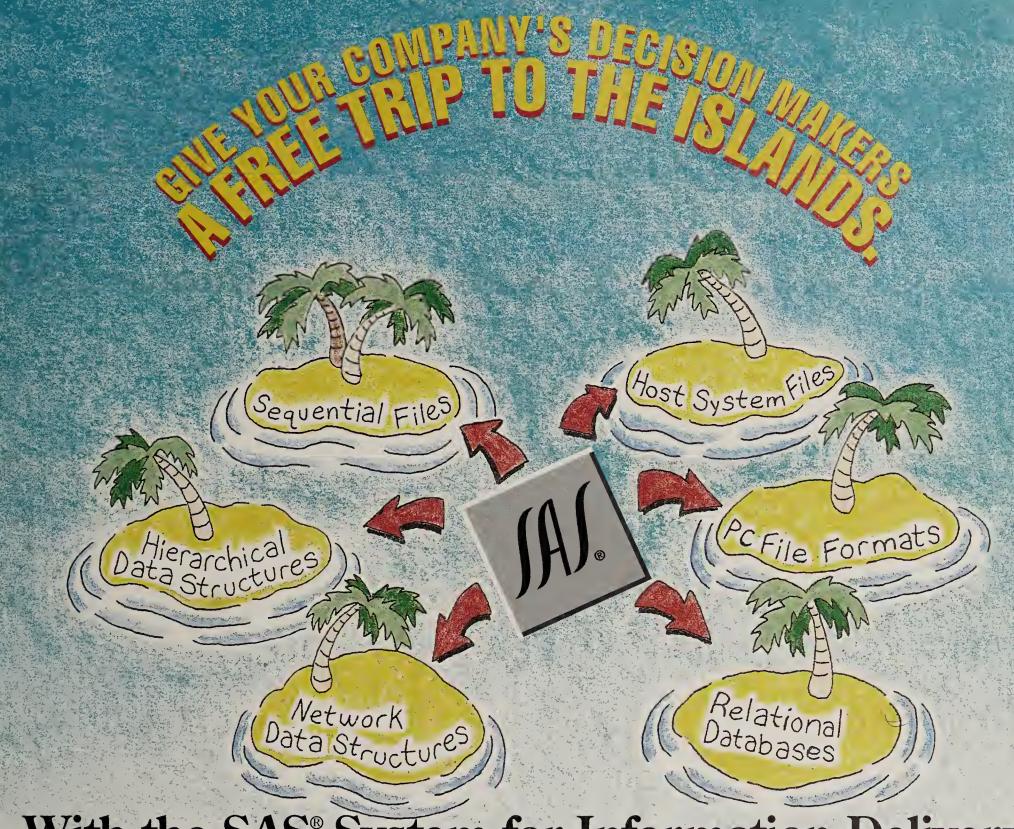
Users also said Ethernet is better-

The low-end Ethernet switch fills out IBM's Ethernet product line, which now runs the gamut from adapter cards and hubs to management software.

Next on IBM's non-Token Ring product schedule are Ethernet switches that support XT/AT bus, Extended Industry Standard Architecture and PCMCIA-based PCs — the current switch supports only IBM's Micro Channel Architecture — and 10/100M bit/sec. adapter cards, according to Laura Knapp, senior technical adviscr for IBM networking systems in New York. Future switches will include support for high-speed networking technologies such as 100M bit/sec. Ethernet and 100VG-AnyLAN, shc said.

However, Knapp said IBM will not forget about Token Ring and that users can expect to see Token Ring adapter cards and switches supporting full-duplex data transmission by year's end.





## With the SAS® System for Information Delivery

Now you can put all your remote "islands" of information within easy reach of your organization's decision makers. With the SAS System, data—regardless of type, file structure, or hardware platform—becomes a generalized and available resource.

You can provide transparent access to relational databases such as DB2®, ORACLE®, Rdb/VMS™, and SYBASE®... PC files such as dBASE®, Lotus® .DIF, and OS/2® Extended Services<sup>™</sup> Database Manager... and a variety of other file types. The SAS System invokes the power of Structured Query Language (SQL) for data access and display.

The SAS System's unified approach to data helps you hold down costs (why maintain unnecessary duplicate files?) while also reducing your training and support burden (since every department shares the same path to data).

Even more important than data access is the ability to turn raw facts into real information. Using the SAS System, decision makers at every level of your enterprise can exploit the power of the world's leading information delivery system. Choose integrated applications for EIS,

forecasting, project management, corporate reporting, quality improvement, electronic spreadsheets, and hundreds of other tasks.

Just Give Us a Call to Reach Your Remote

Call us today at our strateour f for more details about our strategy for enterprise-wide data integration ... plus a free video introduction to the SAS System for Information Delivery. We'll also tell you how you can evaluate the SAS System free for 30 days.

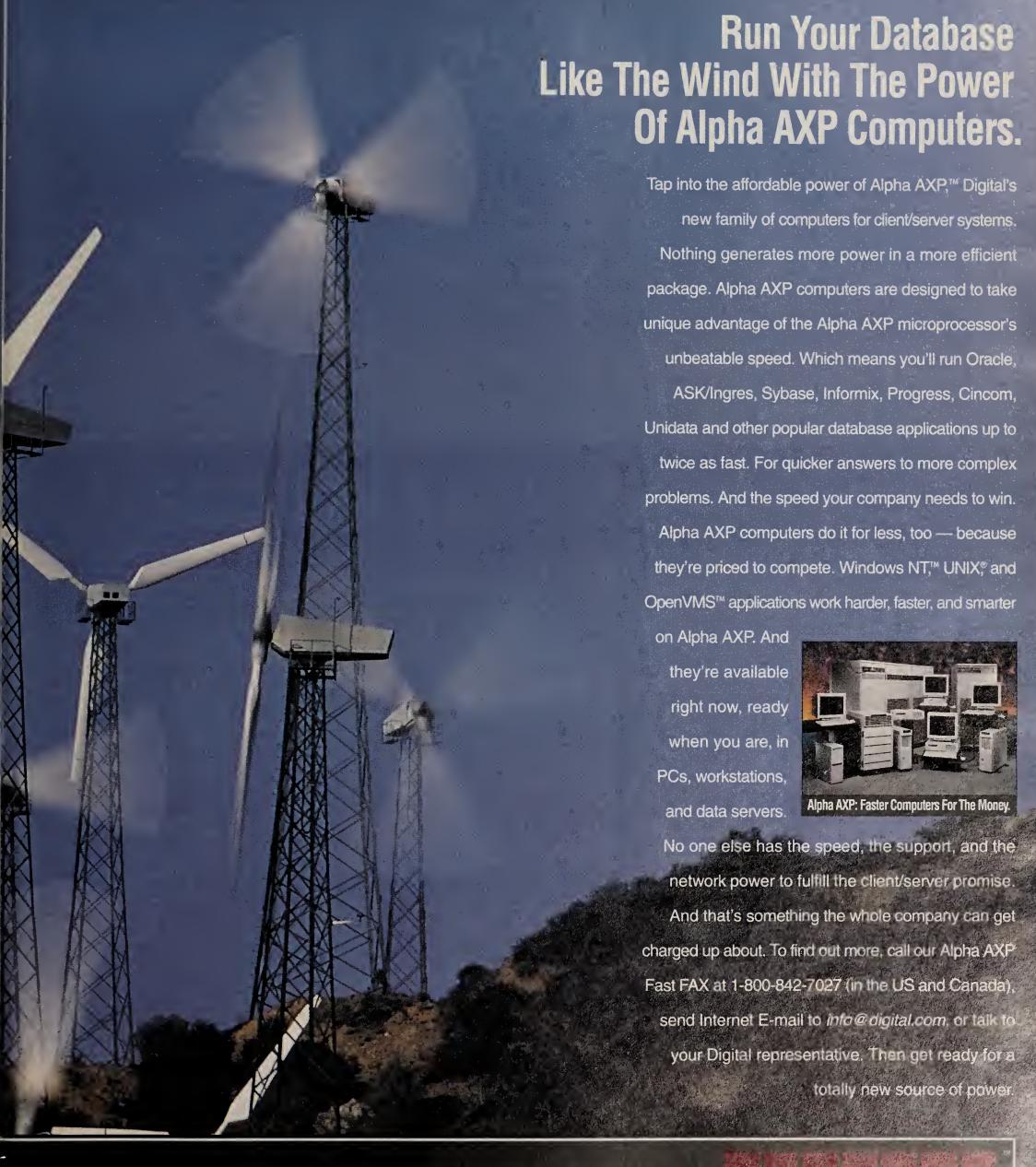


SAS Institute Inc. Sales and Marketing Division SAS Campus Drive 
Cary, NC 27513 Phone 919-677-8200 
Fax 919-677-8123



Putting Technology To

Approach on the contract of th



digital

## NextStep port to DEC OSF/1 on way

By Kim S. Nash

Next Computer, Inc. last week announced a deal with Digital Equipment Corp. to port part of the NextStep objectoriented development environment to the DEC OSF/1 operating system by sum-

Next's so-called Portable Distributed

Objects (PDO) kit is a server-based object model and messaging architecture drawn from parts of NextStep. In broad strokes, Next's distributed object framework was built to let objects send and receive messages regardless of whether they reside in the same application or on the same computer. Further, with PDO the objects can live on operating systems

other than NextStep, which is based on Intel Corp. processors.

With PDO on DEC OSF/1 and other non-Next operating systems, users have a choice of server, said Matt Peron, officer at The First National Bank of Chicago. The bank is not limited to Intel-based machines and can select the fastest hardware and operating system available for its object-oriented applications, which often require more processing power than traditional software, he said.

PDO for Digital servers is due out by June, when Next is expected to release

Version 2.0 of the product, said Steve Jobs, Next president and chief executive officer.

But the Digital edition is not expected to ship until after a similar product for Sun Microsytems, Inc.'s Solaris and SunOS op-

PDO pricing is the same on Digital, HP and Sun platforms, according to Next's Steve Jobs: \$2,500 for a small server version, \$5,000 for a medium-size server version and \$10,000 for a large

server version.

Standard price

erating systems. Those versions are due out in late April or early May, Jobs said. PDO for Hewlett-Packard Co.'s HP/UX has been available since late last year.

#### Computervision signs Rolls-Royce megadeal

By Jaikumar Vijayan

Computervision Corp. has clinched a \$21.4 million deal with Rolls-Royce Aerospace Group in what represents the vendor's largest single contract for software and services.

The initial order is for 1,000 seats of Computervision's Computer-Aided Design and Drafting System (CADDS) 5 and Engineering Data Management products. Rolls-Royce, based in the UK, has the option of buying another 1,000 seats by the end of the decade — lifting the potential value of the contract to nearly \$60 million over seven years, according to a spokesperson for Bedford, Mass.-based Computervision.

The aero engine group of Rolls-Royce will use the software to electronically design the more than 18,000 components of a modern jet engine. The software will help engineers "build" and test jet engines before metal or composites are even cut.

The process, called Electronic Product Definition (EPD), is expected to save Rolls-Royce several million dollars in physical models, according to Garreth Evans, Computervision's vice president in charge of the Rolls-Royce account.

"The real benefit, though, is that the time spent in developing aero engines is going to be drastically reduced," Evans said. He said EPD will cut product development time for a new jet engine — typically six to eight years from design to manufacture — in half.

Rolls-Royce and Computervision have worked together since 1979 to develop a computer-aided design and manufacturing process for the aero engine manufacturer, according to a Rolls-Royce spokesperson. The Rolls-Royce Trent aero engines that power Bocing 777 and Airbus A330 aircraft were designed with Computervision software.

## Beame & Whiteside TCP/IP & NFS Networking Software for DOS & Windows.

#### It's everything your networking software should be:

- ✓ Easy to install and configure
- ✓ Runs with DOS, Windows<sup>™</sup> and WFW
- ✓ Windows version uses no DOS memory
- ✓ Simple user interface
- ✓ Easy-to-use Windows applications
- ✓ VT220 and TN3270 capability
- ✓ Link network resources with NFS
- ✓ Client and Server applications

- ✓ SOCKETS, WinSock and NetBios API
- ✓ SNMP support, NIS, DNS, & HOST naming
- ✓ Supports ODI, NDIS, Packet and SL/IP interface specs
- ✓ Coexists with proprietary networks such as NetWare, Lan Manager, Vines
- ✓ Ask about our NFS Server for DOS and Windows

Beame & Whiteside networking software has it all, and we can prove it. Call us toll-free today for your free 60-Day Evaluation Copy: 1-800-INFO-NFS.

For a fast Evaluation, fax your request including address to (919) 831-8990.



Best Advanced Package: Windows



Beame Whiteside **Software** 



\*Developer tested only Novell makes no warranties with respect to this product.
Windows is a trademark of Microsoft Corporation. Bearne & Whiteside Software is a trademark of Bearne & Whiteside Software, Inc., 706 Hillsborough St., Raleigh, NC 27603, Tel: (919) 831-8989, Fax: (919) 831-8990. ©1994 Bearne & Whiteside Software, Inc. (025)

## When your legacy applications run out of road, think Flashpoint.



Your host systems have taken you far. But now your

users are demanding graphical interfaces and they want integrated applications that work with popular PC packages. Fortunately, it's not the end of the road. Just think Flashpoint® from KnowledgeWare.®

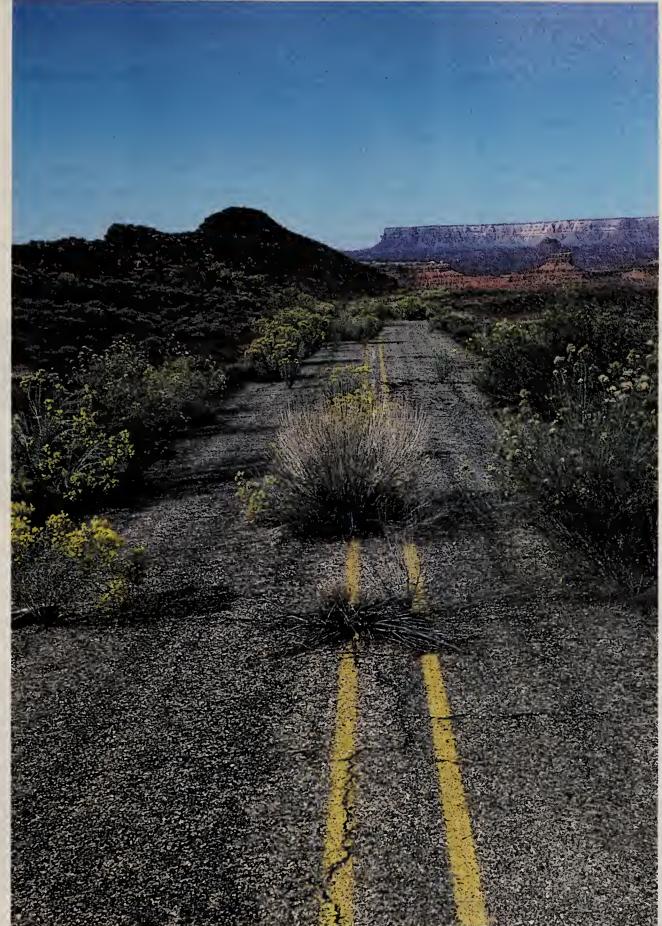
Flashpoint is a Windows-based design tool that quickly builds graphical interfaces for your 3270 and 5250 applications. Flashpoint also lets you integrate host, LAN, and workstation applications into a single desktop – and even downshift some processing from the host to the PC.

Your users get consistent, easyto-use interfaces and direct access to the information they need. Plus you bypass labor-intensive, costly development efforts.

So if you think you've reached a dead end, call KnowledgeWare.

We have the tools, experience, and award-winning support to get you where you need to go.











©1994 KnowledgeWare. KnowledgeWare and Flashpoint are registered trademarks of KnowledgeWare, Inc. All other trademarks belong to their respective hold

The landscape is changing rapidly. LANs are tying into WANs. Mobile computing is changing the way America goes to work. Corporate assets are no longer just measured in dollars, but in bandwidth, data, the quality of your software, the knowledge of your work force.

The cost of computers and software is plummeting. Yet the cost of managing all of these enduser resources is skyrocketing.

Data management. Application installation and upgrades. Metering. Security. Software piracy. End-user



Today, Norton Network Series products share a common console. Tomorrow, they'll share information between each other. Allowing you to reap the full benefits of integrated management across your enterprise.

support. Site license management. The issues go on and on.

Yet no matter how diligently you provide your users and your management with solutions that work today, you have to keep one eye focused on the future.

Because while you're busily answering these urgent, time-consuming and often tedious tasks,

It's an evolving and expanding set of network utility products called the Norton Network Series.

## THE NORTON NETWORK SERIES.

All Norton Network Series products are designed to work together so you can manage all



you're still faced with the most critical challenge of all: creating a reliable, responsive, information-rich network that will make your entire business ever more competitive.

Today, Norton Network Series products let you centrally manage your desktops, servers and LANs. Tomorrow, they'll let you centrally manage all of your end-user resources from a single remote user to a growing worldwide WAN.

At Symantec, we've created a powerful new set of management tools to help you address these issues and meet this critical challenge.

of your user resources centrally, from one console, on one desktop.

For MIS today, it means the end of sneaker-net and the beginning of an enterprise-wide strategy that will save you massive amounts of time, take enormous pressure off your budgets and let you focus on the big picture.

## FROM THE DESKTOP TO THE ENTERPRISE.

For nearly a decade, Peter Norton has been the premier supplier of tools and utilities for desktop PC management.

Now we're bringing the same level of expertise to your network.

All of our Norton Network Series products share a common architecture that will enable them to be so tightly integrated with each other, they will effectively operate as one.

Today, they share a single

Symantec, Norton Administrator for Networks, Norton AntiVirus, pcAnywhere, Norton DiskLock Administrator, Norton Utilities

central console with a single user interface. Tomorrow, they'll share data across applications.

So an antivirus intervention can automatically trigger a backup file restoration to the affected site.

A new software upgrade can automatically trigger an updated software inventory report.

License metering on one LAN can trigger metering on another LAN. Whether it's in the same building or in another city.

Born in the heterogeneous computing environments of the 90s, all Norton Network Series

Ever wondered where your time goes and how to get it back? Norton Network Series products are the answer.

an immediate and impressive contribution to your overall corporate bottom line.

It's nearly instantaneous payback.

Norton Administrator for Networks<sup>™</sup> centralizes licensing, metering, inventory and the distribution of software across



Administrator™ enables the configuration and distribution of DES level security to all of your desktops.

And to give you centralized control of all the applications

your workgroups can access on your network, there's The Norton Desktop™ Menuing Admin Pack.

Together, these products will dramatically improve the efficiency

## TWO THOUSAND COMPUTERS. ELL IS GOING ON?

products are platform independent, and designed to work on a wide variety of LAN implementations.

What's more, they're invisible to your end-users. So they won't

REAL PRODUCTS FOR THE REAL WORLD. TODAY.

Series is evolving. But it's definitely

The core foundation is here

today. Ready to make a major

contribution to your corporate

enterprise strategy. And to make

The Symantec Norton Network

negatively impact the productivity of your users one iota. And you won't ever have to worry about the possibility of user interference in the management of your critical corporate computing resources.

not vaporware.



your network from one central console on your workstation.

Our Norton AntiVirus® for NetWare and Norton AntiVirus 3.0 provide antivirus protection

across your network on both your desktops and your servers.

Peter Norton pioneered the management of end-user desktop resources in the 1980s. Today, we're bringing our expertise to the management of your end-user resources across your enterprise.

Norton Utilities Administrator<sup>™</sup> gives you a complete set of network utilities for proactive end-user data and system repair without user intervention.

pcAnywhere<sup>™</sup> gives your users the power to connect to their computers from remote sites and enables you to support them all from one central location.

Our new Norton DiskLock

of your network. From day one.

More importantly, they'll meet your needs tomorrow. Whether it's managing a growing WAN or supporting a lone telecomputer in some far off, distant location.

Call us and we'll send you the information you need to make an informed decision regarding the Norton Network Series and the dramatic impact it can have on your entire company.

Then get ready to step into the future.

#### CALL 1-800-453-1135.

Ask for Extension 9B13 and request our report detailing the impact the Norton Network Series can have on the management of all the end-user resources in your enterprise.



Report available in U.S. only.
For more information in Canada, call I-800-667-8661.



Administrator and The Norton Desktop Network Menuing Admin Pack are trademarks or registered trademarks of Symantec Corp. All other trademarks or brand names are the property of their respective holders. ©1994 Symantec Corp. All rights reserved.

### Internet panel finds reusable passwords a threat

By Gary H. Anthes WASHINGTON

A panel of experts disagreed last week on how savvy users really are about network security. But on one point they were unanimous — the time has come to end the use of reusable passwords.

Testifying before a congressional com-

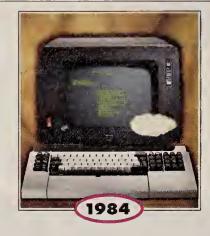
mittee probing a rash of Internet intrusions facilitated by "password sniffing," the panel said users should move to one of the advanced techniques in which passwords are used only once, are sent encrypted over networks or both.

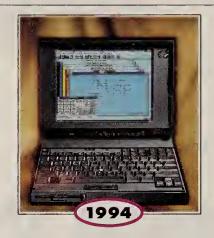
On Feb. 3, the Computer Emergency Response Team (CERT) at Carnegie Mellon University in Pittsburgh sent an alert over the Internet warning millions of users of a dramatic increase in illegal network monitoring. This involves intruders gaining privileged access to a computer and installing "sniffer" software to monitor the system's network interface port and collect log-in information, including passwords [CW, Feb. 7].

"The Feb. 3 alert signaled the end of re-

usable passwords as a reliable means of security," said L. Dain Gary, manager of the CERT Coordination Center, in a speech to the House Science subcommittee.

"Traditional user authentieation by means of reusable passwords does not provide strong security in today's networked environment — with or without





## Now that terminals are no longer dumb, your connectivity solution had better be smart.

Introducing A2B—The smart software solution You know the problem: how do you get PCs running Windows to connect with IBM® 3270-based servers — without spending countless manhours to continually walk your users through the process? ♠ The solution is A2B™. A robust new software product that makes it vastly easier for PC users to get connected and stay connected. Opening up a whole new world of connectivity

If you're making the transition from proprietary networking architectures like SNA<sup>™</sup> to the open world of TCP/IP, you'll appreciate A2B. It gives your users simultaneous access to any ASCII-hased server on their TCP/IP backbone as well as their mainframe environments. ❖

Suddenly your 3270 is no longer a thing of the past.

You've extended its useful life and merged it with newer technologies, saving money and headaches. And this TCP/IP

"total connectivity" paradigm extends even to 3287 printing.

Easy, secure access for remote users As remote access becomes increasingly important, you'll like the way A2B connects users over dial-up, packet-switched, or even cellular networks. A2B even gives remote users an icon-based quick set-up, which lets them deal painlessly with complex asynchronous connections or X.25 networks. Perfect for users who "don't do networks" More than easy, A2B is also fast and reliable. Using A2B's

SplitSecond' option, you can dramatically improve your users'

response times by reducing the volume of data transmitted over the network — up to a 70% reduction. SplitSecond actually remembers frequently used screens and only transmits the information that has changed. • You can even shield your users entirely from the connection process by means of Simware's powerful REXX-based programming language, which is included with the package. Your gateway to total connectivity — and beyond

Because you have users in a variety of locations,

A2B supports coax boards and the most popular

LAN gateways, including NetWare® for SAA®

and LAT as well as EICON's X.25 gateway.

Because you can't "shrink wrap" expertise Simware

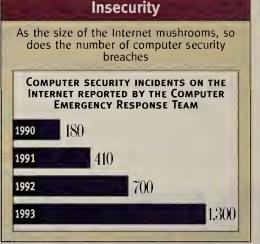
products, even beyond the sale. That's why every aspect of A2B is designed to be user-friendly and low-maintenance. And why Simware's support is second to none. Call or fax today, and find out how easy it can be to combine the strength of your PC with the power of your mainframe, whether you're local or remote. Ask about our DOS and Mac solutions too.

Call or fax now! For a free A2B demo disk, fax your business card to (613) 727-3533 or call 1-800-267-9991 ext. 232



The smartest connection you can make

2 Gurdwara Road, Ottawa, Ontario, Canada K2E 1A2 Main. (613) 727-1779 Fax: (613) 727-3533 All trademarks and registered trademarks are the property of their respective owners.



Source: Computer Emergency Response Team, Software Engineering Institute, Carnegie Mellon University, Pittsburgh

encryption," testified F. Lynn MeNulty, associate director for computer security at the National Institute of Standards and Technology. Internet hosts protected by "advanced methods such as tokens or smart cards" were not at risk, he said.

"Let me emphasize that this threat is not limited to the Internet," said Stephen D. Croeker, a vice president at Trusted Information Systems, Inc. in Glenwood, Md. "The same threat exists in every local-area network."

Nevertheless, Thomas T. Kubie, chief of the Federal Bureau of Investigation's Financial Crimes Section, testified that in more than 80% of the FBI's computer crimes investigations, the Internet was used to gain illegal access to systems.

#### New technologies on the way

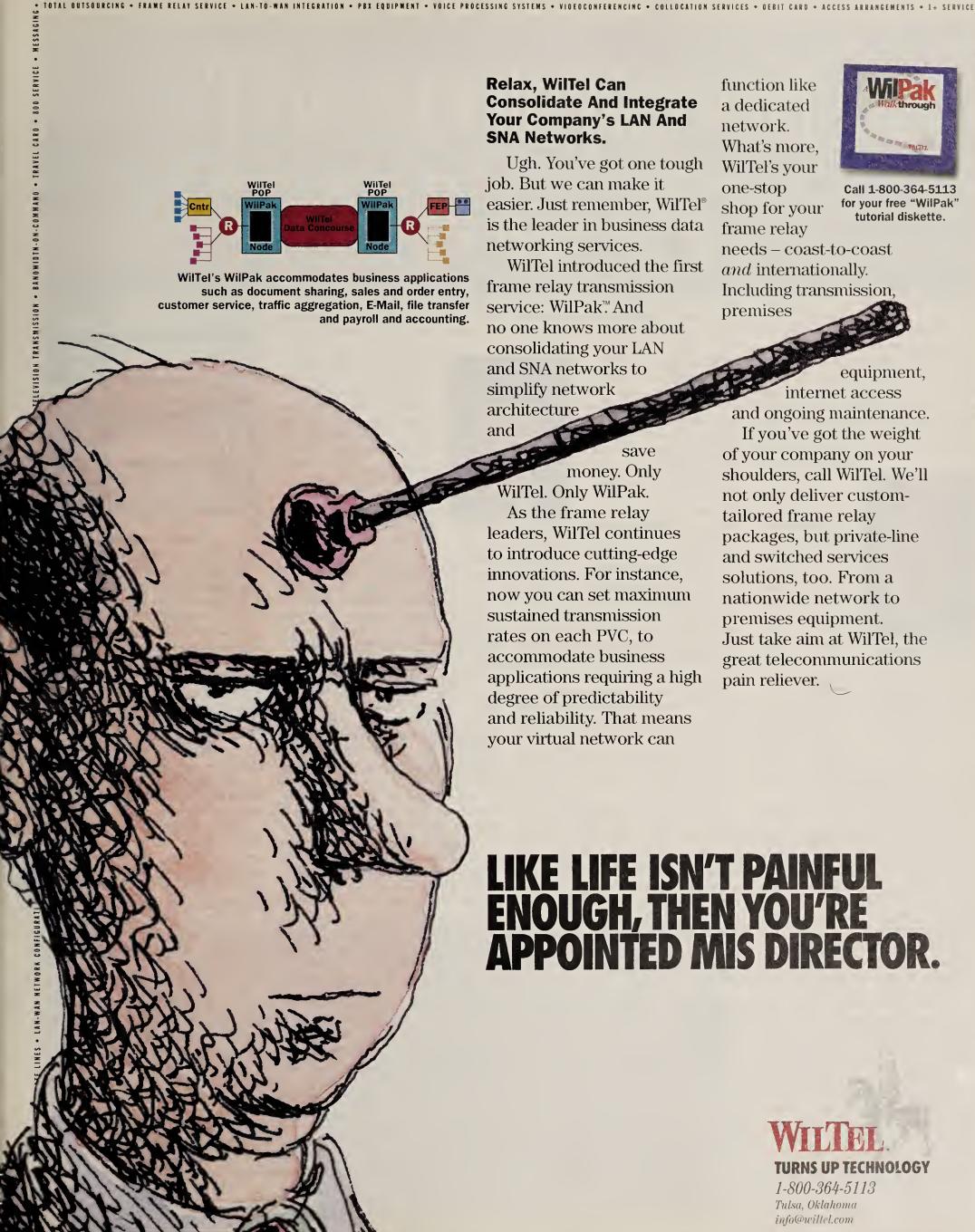
Vinton G. Cerf, president of the Internet Society and senior vice president for data architecture at MCl Communications Corp., said users are aware of the risks and payoffs of Internet use. However, he said some 30,000 Internet Protocol networks — one half of all IP networks — could be attached to the Internet but are not, largely because their owners are worried about security.

Cerf said technologies are emerging that will enable information on internal networks to be partitioned between what is to be made publicly available and what is to be held confidential.

Gary said users are partly to blame for products without security features. "Systems should be configured for security prior to being shipped," he said. "But now, demand is for products that work, for performance, low eost and interoperability. Security is not being asked for."

Several panelists assailed government export control policies that bar export of software with the most popular encryption techniques.

A smart card-based security system generates use-once passwords. See page 51.



#### Relax, WilTel Can **Consolidate And Integrate** Your Company's LAN And **SNA Networks.**

Ugh. You've got one tough job. But we can make it easier. Just remember, WilTel® is the leader in business data networking services.

WilTel introduced the first frame relay transmission service: WilPak™ And no one knows more about consolidating your LAN and SNA networks to simplify network architecture

money. Only WilTel. Only WilPak.

As the frame relay leaders, WilTel continues to introduce cutting-edge innovations. For instance, now you can set maximum sustained transmission rates on each PVC, to accommodate business applications requiring a high degree of predictability and reliability. That means your virtual network can

function like a dedicated network. What's more, WilTel's your one-stop shop for your frame relay



Call 1-800-364-5113 for your free "WilPak" tutorial diskette.

needs - coast-to-coast and internationally. Including transmission, premises

equipment, internet access and ongoing maintenance.

If you've got the weight of your company on your shoulders, call WilTel. We'll not only deliver customtailored frame relay packages, but private-line and switched services solutions, too. From a nationwide network to premises equipment. Just take aim at WilTel, the great telecommunications pain reliever.

LIKE LIFE ISN'T PAINFUL ENOUGH, THEN YOU'RE APPOINTED MIS DIRECTOR.

• VOICE PROCESSING SYSTEMS • VIDEOCONFERENCING • COLLOCATION SERVICES • DEBIT CARD • ACCESS ARRANGEMENTS • 1+ SERVICE •

1-800-364-5113 Tulsa, Oklahoma info@wiltel.com

## Computer Industry

## Sun targets enterprise server sales

Scott McNealy, Sun

CEO: 'We'rc a little

more empathetic to

customers' legacy

systems issues'

By Jean S. Bozman

When Sun Microsystems, Inc. sat down with the rest of the Unix community last week to join a revamped Open Software Foundation (OSF), it demonstrated a new and determined pragmatism designed to boost profits at the \$4.3 billion company.

While sales of Unix workstations are still growing and constitute about threefourths of all revenue, profit margins have shrunk during the past two years due to the "commodity" pricing of lowend machines from rivals Hewlett-Packard Co. and Silicon Graphics, Inc. Now, Sun is placing new emphasis on building up sales of its large-scale Unix servers

> corporate enterpriscs.



Ed Zander, SunSoft president: If Sun is going to be a \$10 biltion entity by the end of the decade, we have to find more users for our technotogies'

The SPARCserver 1000 and SPARCcenter 2000, shipping since May and June, respectively, already generatc nearly 20% of Sun's sales, but with higher profits. At the same time, Sun is pushing harder to make its Solaris operating system a standard "brand"

designed to encourage application development by third-party independent software vendors [CW, March 21].

Earlier this month, Sun revamped its bread-and-butter workstation lines with faster chips and new packaging and added a high-end redundant arrays of inexpensive disks subsystem for backup and recovery of large relational databases hosted on Sun servers.

#### Culturalshifting

Sun's server and software initiatives will be showcased here next week during an Enterprise Summit — dubbed the "Big Bang" by Sun in typical tongue-in-cheek style — that coincides with the SunSoft, lue, developer's conference.

Along with the shift from workstations to servers comes a subtle change in corporate culture, top Sun executives said last week. "We are still religious about open interfaces and barrier-free interfaces," said Chief Executive Officer Scott McNealy. "But we're a little more empathetic to customers' legacy systems issues. We're very sympathetic since we have our own mainframe environment."

Sun outsourced its mainframe applieations, which handle 10% of the information technology work load, to Computer Sciences Corp. The mainframe applications will run until Sun installs Oracle Financials Release 10, which is not shipping yet, on Sun servers, said Sun Chief Information Officer Bill Raduchel.

Nothing less than a change in corporate culture is required for moving into the role of enterprise server provider, said Sun Microsystems Computer Corp.'s new president, J. Phillip Samper.

Such a change requires attention to the complex integration needs of large information systems sites (see story below), although Sun is prepared to refer its customers to outside systems integrators such as Andersen Consulting and Electronic Data Systems Corp.

#### No time for ego

"I think we have to understand the needs of the customer much more than we have in the past," said Samper, a former Eastman Kodak Co. executive and Sun

board member. Sun can hardly afford to rest on its laurels, he said. "There is always the fear that with size comes arrogance. But the leader of today can lose that position in no time."

Raduchel said Sun is evaluating which of its own 300 on-line applications, such as network-based expense accounting and software management utilities, can be turned into products. This will enable the vendor to use its own IS experiences as a template for enterprise Unix applications and services.

In the Sun user base, there has already been some erosion among traditional customers in the scientific and engineering community. They are resisting the conversion from older SunOS/Solaris 1 operating systems to Solaris 2, which is based on a different Unix variant. Scientists were the first to exploit all the Unix extensions in SunOS, requiring them to rewrite custom applications from scratch, rather than installing Solaris 2 versions of commercial Unix packages.

Key Sun user sites also noted that Sun's hardware is no longer enough to sway a sure sale, time after time.

"When you're the leader, you can make the rules as you go," said Jerry McEach-

> ern, manager of technology resources at the Houston "But when Chronicle. you're not, you've got to work with other vendors, you've got to work with your users and make their life easier. Otherwise, they're going to go down the road to the next vendor."

But some users said Sun is more interested in selling its own hardware platforms and Solaris operating system than coping with the complexities of most IS architectures. "Sun comes across as more interested in

getting in the door than in selling to the enterprise." said Rich Cromie, a senior systems analyst at Pacific Bell's San Diego site. "They didn't come in, like HP did, and ask about my business needs. They asked what could they do to make this

#### Changing the name of the game

Cromie, who counts himself as a Sun supporter, emphasized that Pacific Bell relies on hundreds of Sun machines outside the data center. To cross into the data center, Sun needs to "show how they can help the business," he said. "They need to go in as a consultant first and a hardware provider second."

Sun's willingness to change the game for the sake of growth is clear to many analysts. "There have been a number of

Sun Microsystems, Inc. Sun saw a decline in its income for fiscal year 1993 because of pricing and fierce competition on the low-end side of the workstation market

Net re	venue	
Q2 1994	\$1.1B	
Q1 1994	\$960M	
FY 1993	\$4.3B	
FY 1992	\$3.6B	
Net income		

Net income		
\$44M \$17M		
\$157M \$173M		

moves in the last two years that I would characterize as indicative of increasing pragmatism," said Jeffry Canin, a research analyst at Salomon Brothers, Inc. in San Francisco.

Some examples of that pragmatism include adoption of the OSF/Motif user interface, reversal of a long-held stance against selling X Window System terminals and the year-old Common Open Software Environment partnership with IBM, HP and other Unix vendors, which last week became part of a restructured OSF (see page 4).

Sun was able to avoid losses under competitive pricing pressure due to its unique subsidiary business model, which devotes development resources to dedicated business units. "Profits have been up and down at Sun," noted Scott Winkler, a program director at Gartner Group, Inc.'s software management strategies service. "But you have to give them credit — they are profitable, and they're still growing."

#### Sun costs push users to NT clients

any commercial sites like their Sun servers but ta Cancer Research Board in Edmonton, Alberta, ownership of 100 Sun machines—including a dozen SPARC 10 servers — has not prevented the growth of Windows clients and experimentation with Microsoft Corp.'s Windows NT-based servers.

"Sun is no longer the price/performance leader on the desktop, and increasingly we are growing Windows clients," said Felix Fridman, director of IS at the \$60 million not-for-profit health agency. Another concern, he added, was that Sun nearly doubled the site's Solaris licensing fees with a new processor-based pricing schedule.

But many Sun users are confident that their Sun servers

are a cost-effective alternative to mainframes and aging are concerned about climbing costs. At the Alber- minicomputers. In 1990, Dunkin' Donuts, Inc. in Randolph. Mass., replaced an aging Burroughs Corp. mainframe and most software from a Wang Laboratories, Inc. computer with two Sun 690 servers and an Oracle Corp. database. Oracle's Financials packaged software suite will be installed to replace the old Wang software.

> Dave Bennett, Dunkin' Donuts' IS director, said users will benefit when Sun cooperates more closely with other Unix vendors. "While they always feel they may have the better piece of technology," he said, Sun has always maintained "it's not whether you're first to market, it's whether you're first to volume [shipments] that's important. They've got to listen to their own words."—Jean S. Bozman

## The Apple Report On PowerPC

#### NUMBER 3 — APPLICATIONS ACCELERATED FOR POWER MACINTOSH

On average, a Power Macintosh achieves two to four times the performance of 68040 and 80486 machines running the same programs.

If you use applications that do floating-point mathematical calculations, your performance levels could be up to ten times those of the same program running on a 68040 machine - and several times faster than the fastest Pentium system-based computers.

A Power Macintosh offers unprecedented compatibility between Macintosh, MS-DOS and Windows environments, thanks to an emulation program called SoftWindows, which licenses Windows code from Microsoft.

If you buy a 68040-based Macintosh today, can you upgrade it tomorrow? In a word, yes. Just look for the "Ready for PowerPC upgrade" sticker on the box.

For more information about Power Macintosh computers, call 1-800-732-3131, ext. 150. We'll send you a free copy of PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems. In Canada, call 1-800-665-2775, ext. 910.

Power Macintosh<sup>™</sup> computers are here. The new family of Macintosh computers with PowerPC chips run virtually all

Macintosh system-based software and most current programs for MS-DOS and Windows Accelerated for Macintosh with operating systems.\* So whatever computing environment you're working in now, you can migrate to a more powerful desktop

computer without losing your investment in your current software.

But the real benefit of the new Power Macintosh computers can be seen with new applications that take advantage of the PowerPC chip's advanced capabilities.

These applications, often called native applications, will offer two to four times the performance of programs available for the fastest Macintosh computers today.

Developers writing native applications also report that these applications perform at levels better than their Windows counterparts running on Intel Pentium systembased computers.

#### Major developers on board.

Right now, the world's leading developers are updating their most popular and memory-intensive programs to take full advantage of Power Macintosh computers.

In fact, Apple has been working closely with more than 200 major third-party developers since 1992 to create powerful new versions of their applications.

And since software development kits became widely available in January, hundreds of additional developers have begun the move to Power Macintosh computers.

PowerPC technology enables them to build unprecedented speed and functionality into applications for the Macintosh system. Developers everywhere are eager to exploit these new capabilities.

#### Do more in less time.

What do the advanced capabilities of native applications mean to you? You'll spend significantly less time waiting for your computer to redraw or recalculate or re-anything. That means you'll have more time to create and refine your work,

to apply new concepts, to test options.

You can also expect to see new kinds of applications — software that is both more intelligent and easier to use.

Developers will be exploring new features in areas such as intelligent help, 3-D design, video, animation, speech recognition and text-to-speech conversion.

Many of these new functions simply wouldn't be practical without the superior processing capabilities of a RISC chip and innovative Macintosh technology.

#### Why RISC?

The new Power Macintosh computers are the first personal computers with RISC (Reduced Instruction Set Computing) chips —ultra high performance chips previously available only in workstations.

(In fact, many workstation developers are now writing applications for the Macintosh platform for the first time.)

plex than comparably powered CISC chips. So they cost less to produce. Which means that Power Macintosh computers offer a significant advantage in price as well as performance. In the best of all possible worlds, all personal computers would offer you

The power to be your best."



What about software?

A Power Macintosh will run virtually

all of your existing Macintosh system-

based programs. The real benefit

of a Macintosh with PowerPC technol-

ogy, however, is with applications

optimized to take advantage of the

new chip's advanced capabilities.

Here are some of the native applications that are available now or will

be out in the next few months:

4th Dimension

Adobe

**Dimensions** 

Adobe

Illustrator

Adobe

Photoshop

Adobe Premiere

Aldus

FreeHand

Aldus

PageMaker

Alias

Sketch!

Claris ClarisWorks

Fractal Design

Painter

Frame

FrameMaker

Insignia Solutions

SoftWindows

Microsoft

Excel

Microsoft

Word

Specular Infini-D

Strata

StudioPro

**VideoFusion** 

VideoFusion

Virtus

WalkThrough

Wolfram

Mathematica

WordPerfect

WordPerfect

this kind of power.

CONTROL CONTRO

# Thousands of IBM products. Four easy-to-use catalogs. One toll-free number.

Now you have a direct line to the vast array of IBM products and services featured in the IBM Direct catalogs. From compilers to complete CPU upgrades, it's all here and it's all just a 1800 IBM-CALL away.

Use IBM Direct as your direct source for IBM business products. Simply dial 1800 IBM-



and a complete selection of IBM mainframe software.

#### The IBM RISC System/6000 Direct Catalog.

Use this comprehensive guide to extend the range and reach of your RISC System/6000® with easy upgrades and everything from workstations, peripherals and accessories to systems and application software, tools, languages and utilities.

## The IBM AS/400 Direct Catalog.

This comprehensive resource for all your AS/400® needs makes it easy to order upgrades, processors, peripherals

and workstations; systems and application software, tools, languages and utilities; plus communications and LAN hardware and software, client/server software and more.

## The IBM Networking Direct Catalog.

All the right tools to maximize your client/server connection are here under one cover. You'll find operating systems, communications hardware, client/server and network manage-

ment software,
internetworking hardware and software,
routers, bridges
and hubs, as well
as adapters and
connectors.





This is the all-inclusive IBM mainframe software source for operating systems; application development

tools; client/server, database and data delivery software; a full range of

systems, network and storage management tools; and office systems, publishing systems and image processing products.

TEM

We wrote the book on service and support, too. When you dial 1800 IBM-CALL you'll have instant access to specially trained IBM Direct staff members who are experts on your particular platform.

When you buy Direct, you're assured of top-quality IBM hardware products backed by the same reassuring

Mainframe

1800 IBM-CALL

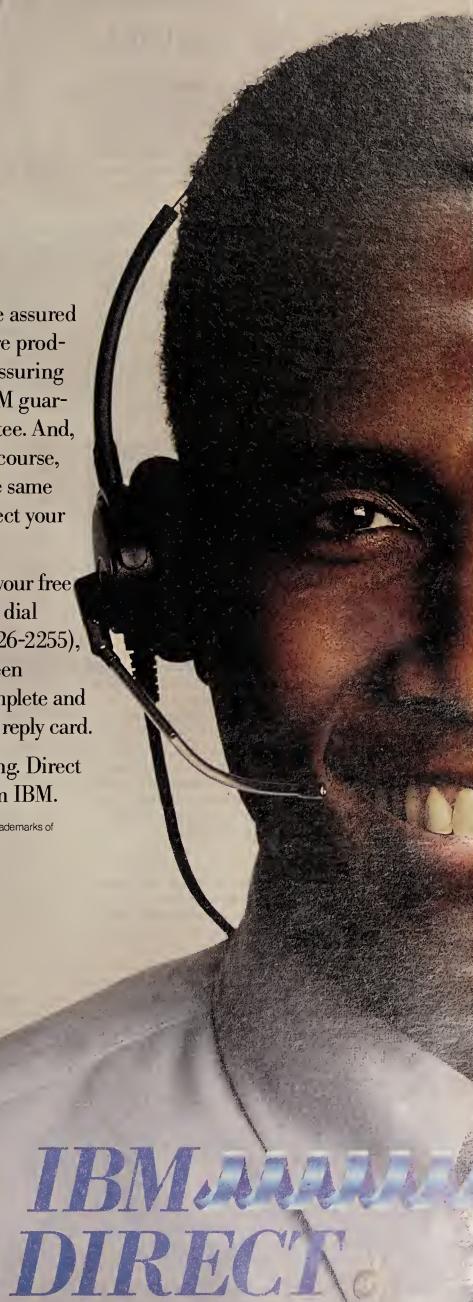
IBM guarantee. And. of course. the same

exclusive warranties to protect your software purchases.

To place an order or request your free IBM Direct catalogs, simply dial 1800 IBM-CALL (1800 426-2255) dept. 100A, weekdays between 8 a.m. and 8 p.m. ET, or complete and return the attached business reply card.

Direct access. Direct ordering. Direct support. It's IBM Direct from IBM.

®IBM, RISC System/6000 and AS/400 are registered trademarks of International Business Machines Corporation Service available in U.S. only. © 1994 IBM Corporation.



#### Editorial

#### Dear Mr. Noorda

#### Call it off, Ray. While you still can.

Novell's \$1.4 billion acquisition of WordPerfect and \$145 million purchase of Borland's Quattro Projust don't make sense. You're paying too much for too little. You're confusing your customers and your stockholders. And you may be about to tear down what you've built so carefully in your 10 years as Novell's chairman.

Novell is a great company, Ray. You've got market share that some communist dictatorships would envy. Your customers love you. Heck, most of your competitors love you. Your hammerlock on the network operating systems market is just about untouchable. The entire industry looks to you for leadership.

But recently Novell has become something different. You've begun to believe your colleagues who say you're the only hope against big, bad Microsoft. You've taken on the role of catcher in the rye to the computer industry, saving wayward children who wander off the cliff. But what is it getting you? DR-DOS is going nowhere on the desktop. Your foray into Unix hasn't

brought any more unity to that chaotic market. In a business climate in which focus is everything, you're losing your focus entirely.

Look at what you're getting for more than \$1.5 billion: A word processor that's the leader in a dying DOS market, a Windows word processor that's so big and slow that almost no one can use it, an E-



mail package that's good but ranks a distant third in its market, a presentation graphics package that's an asterisk on the charts and a spreadsheet whose kickbutt features don't matter much in a market that's become as much a commodity as aspirin.

You're buying a WordPerfect user base that's mad about having to pay for support, and you're picking up two-thirds of a software suite. When you should be busy over the next few months shoring up the suite, you're going to be distracted by managing the layoffs that WordPerfect has already announced and cleaning up the organizational mess over there. Meanwhile, you're already late getting NetWare 4.1 out the door.

Your customers and investors are worried. You have committed to stepping down in June and there's no clear line of succession. Whoever takes over Novell is going to inherit a massive integration task while also coping with the political struggles that a change of leadership invariably creates.

The computer industry doesn't need another Microsoft, Ray. What it needs is good, aggressive competition in each of Microsoft's core markets. Between you and Lotus, it was getting that. Now, Novell is going to be sidetracked by a whole host of issues unrelated to its business. I'll bet the two happiest guys in the PC industry last week were Philippe Kahn, who removed an albatross from his neek, and Bill Gates.

Call off the deal, Ray. This isn't what you want to be remembered for.



Paul Gillin, Editor



#### Letters to the editor

#### Game over

Regarding "Distributed game of doom may cause LANs to crash" [CW, Feb. 21]: Why would any LAN environment — especially in a business — allow any game program onto a computer in the first place? Granted, for a first-time PC user (yes, my company still has many non-PC users) the simple game of solitaire is a great learning tool for the mouse, but beyond that games are a non-productive use of company resources.

I find the last point in the article about collaborative network-based computing to be valid, but must it be a game that provides the solution to a LAN overloaded due to broadcast storms?

Oh, I like playing games — but at home on my own computer

D.D.Pratt Des Moines, Iowa

## A technological entitlement?

In "Deluge of opinions on the information highway" [CW, Feb. 28], Esther Dyson notes that a lot of the people who E-mailed her about the development of the Internet think universal access is good, "but most realized that it shouldn't be free." If it must be subsidized, Ms. Dyson writes, "needy users should be subsidized directly ... so that most users pay its true costs and don't waste it." OK.

In the early 1950s, when TV was new, a family had to be fairly comfortable financially to afford one. The same went for the automobile before about 1920 and the telephone in the 1880s. In the 1990s, you can find welfare families living in demonstrable poverty, but they might also have color TVs and a VCR. They don't have computers yet, but if this technology follows the preestablished path, someday they will.

Doug Johnson Austin, Texas

## Banyan's ENS is a plus for HP

We would like to add clarification to "Banyan ENS extends HP/UX's reach" [CW, Jan. 31] to ensure recognition that Hewlett-Packard views Banyan's ENS product for HP/UX as an important addition for our customers looking to integrate their HP/UX systems into an enterprise network.

The article correctly states that HP's directory strategy is based on X.500 and DCE. This by no means diminishes the importance of our relationship with Banyan or our desire to have ENS on our HP/UX servers. ENS is positioned as a crucial enterprise-level network connectivity solution for HP/UX servers.

HP's strategy focuses on support of network environments that our customers need and currently use, including ENS, Novell's Net-Ware and LAN Manager for Unix. It is extremely important to provide our customers with support and interoperability for their strategic network environments, including ENS, and we believe that

ENS will be a strong choice for integrating HP 9000-based client/server resources worldwide.

We are excited about being able to support ENS on HP/UX and feel this is a very significant addition to HP's set of distributed computing solutions.

Nick Ordon Hewlett-Packard Co. General Systems Division Cupertino, Calif.

## Chicago will have to earn its way

John Gantz's column "Chicago: Will users buy into Microsoft's plans?" [CW, March 7] could have emerged from Microsoft's public relations department. If you ask buyers whether they will actually buy Chicago, they will want to know features, performance and pricing — exactly the factors that shot down Windows NT in the mass market.

Gantz has it backward when he claims that Chicago will happen because Microsoft has too much riding on it. The only way Chicago will happen is if it offers a substantial advantage over Windows at a reasonable cost, the way Windows did over DOS.

Douglas Weinfield Washington

■ COMPUTERWORLD WELCOMES COMMENTS FROM ITS READERS. LETTERS MAY BE EDITED FOR BREVITY AND CLARITY AND SHOULD BE ADDRESSED TO BILL LABERIS, EDITOR IN CHIEF, COMPUTERWORLD, P.O. BOX 9171, 375 COCHITUATE ROAD, FRAMINGHAM, MASS. 01701. FAX NUMBER: (508) 875-8931; MCI MAIL: COMPUTERWORLD. PLEASE INCLUDE A PHONE NUMBER FOR VERIFICATION.

#### COMPUTERWORLD

**Editor in Chief** Editor

Sections Editor

**Assistant News Editor** 

Assistant Sections Editor

Technical Editor

Senior Editors Elisabeth Horwitt Networking Eilis Booker

Networking Craig Stedman Large Systems

Ed Scannell Personal Computing Michael Fitzgerald

Senior Writers Melinda-Carol Ballou Lynda Radosevich Staff Writers Stephen P. Klett Jr. Jaikumar Vijayan

Features Department

Senior Editors Joseph Maglitta, Corporate Strategie Lory Zottola Dix, In Depth Mary Brandel, CW Guide Alian E. Alter, Management

Associate Editors
Jodie Naze, Marketplace and Careers David B. Weldon, Manage

**Assistant Editor** Research Manager Michael L. Sullivan-Trainor

Senior Editor Garry N. Ray, Firing Line Research Coordinators Kevin Burden, Features Stefanie McCann, Graphics

New Products Writer Lisa Davidson Assistant Researcher Erin Callaway, Resource Cente

Chief Copy Editor Anne McCrory Assistant Chief Copy Editor Christina Aicardi Maguire

Senior Copy Editors Kimberlee A. Smith Jill Zolot

Copy Editors Ellen Fanning

Michellé Grabon **Design Director** 

Senior Graphic Designer Tom Monahan Design Assistant Graphic Designer

Graphics Specialist Jose E. Bruzual Cartoonist Rich Tennant

Office Manager Linda Gorgone

Connie Brown Aleksandra Skulte Rights and Permissions Man Sharon Bryant

Computerworld Client/Server Journal

Managing Editor of Special Projects Catherine McCrorey

News Bureaus Mid-Atlantic homas Hoffman, Senior Correspo

Washington, D.C.
Mitch Betts, National Correspondent (202) 347-671B Gary H. Anthes, Senior Correspondent

(202)347-0134 West Coast Senior West Coast Editor

Mark Halper Kim S. Nash Senior Correspondents Chris Flanagan, Editorial Assistant

Midwest Ellis Booker, Bureau Chief (70B) B27-4433 Pacific Northwest Stuart J. Johnston, Senior Corresponden (206) 641-7770

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) B79-0700
TDD: (B00) 428-B244
MCI Mail: 279-6273
CompuServe: 76537,2413
Subscriptions: (800) 669-1002

## The mainframe is dead, but so is the PC

Marc Dodge

urrent revisionist theory says the mainframe is not dead after all. This is a safe bet — we've been shoveling dirt on it for almost a decade. On the other end of the spectrum, the PC hasn't turned out the way we expected it to,

In reality, both platforms are racing toward each other and will collide somewhere between the current functions of both. The mutant won't look anything like a mainframe or a PC. This architectural confusion is great fodder for journalists and industry clairvoyants. Everybody ends up being right at least some of the time. Moore's Law says that computing speeds and chip densities double every 18 months. This pearl of an observation has held for more than a century, starting when cardbased computing technology was used for the

Recently, I heard Ray Kurzweil (of scanner engineering fame) give a keynote address. He predicted that Moore's Law will hold into the next century. By 2020, a standard PC will have the speed and memory capacity of the human

Jeez! It was just a decade ago that Time magazine speculated that the human brain was so complicated that we might never understand its inner workings. Moore's Law makes it clear that we need to fire up our synapses and rethink what makes a box a mainframe or

As processors have decreased in size, computers have gotten smaller. In data centers, mainframe CPU floor space has been reduced dramatically. However, disk drives have more than gobbled up the extra space. Microprocessors will power the mainframe of tomorrow,

but the box will remain in the glass house supporting these forms of disk drives.

Yes, the PC and mainframe architectures are colliding in form. Functionally, however, they will remain separate, at least until we solve client/server prob-

lems. Client/server computing promises to move more work to the PC processor. Today, client/server is saddled with the mainframe. Why? One problem is distributed database software. It has evolved slowly during the past decade — too slowly. Distributed backup, security and systems management compound the problem.

Like it or not, corporatewide data will remain centralized for the rest of this decade. Architecturally, the mainframe is looking more like a PC. Functionally, it is going to remain a mainframe.

Vendor midrange strategies also follow this architectural convergence. IBM is considering resuscitating the System/36 midrange with a PowerPC microprocessor. The last System/36 hardware introduction was in 1988. IBM also

The PC

and the

mainframe

collision with

are racing

each other.

toward a

planstosupercharge the AS/400 with a PowerPC microprocessor in 1995. Such midrange strategies remind me of Samuel Johnson's great line about second marriages: "They represent the triumph of hope over experience."

The PC and main-

frame species are evolving from different directions into a homogeneous animal. The PC is gaining mainframe-like power, and the mainframe is becoming an enterprise server. The mainframe vs. PC argument is for knuckleheads. Everybody's right and everybody's wrong.

Dodge is telecommunications department manager at a Fortune 100 company.

## Just say 'yes' to the Internet

#### Patricia B. Seybold

any corporate IS directors are afraid of the Internet. It looks like an undisciplined universe of hackers just waiting to besiege their corporate systems and waste their employees' time.

You can't quarrel with that point of view. It's founded on more than a grain of truth. But you can take pity on the compa-

 ${\it If you're\ not}$ 

citizen, your

company will

be cut off from

and customers from

around the world.

information

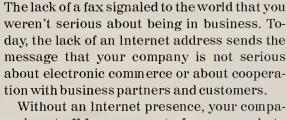
an active

Internet

nies whose top executives hold these prejudices because those firms will become the dinosaurs of the information economy. If you're not an active Internet citizen by the mid-1990s, you're likely to be out of business by the year 2000.

Over and over again, I meet people who apologize when

they hand me their business cards. They're embarrassed that they don't have an Internet address on their card. They hang their heads and explain that their company has an anti-Internet policy. But they also worry that they don't "measure up." Remember when you had to add your fax number to your business card?



ny is cut off from access to free research, to valuable databases and information, to ex-

> perts in almost every field and to potential customers all around the world.

What should you do about this dilemma? How can you lead your company safely onto the electronic frontier? First, you need to understand the Internet. Read several of the many popular books on the subject. Understand the allure of the frontier. Gain

some personal experience. Get an Internet connection and download the Mosaic interface (which any Internet jock can help you find and install) on your PC, Macintosh or Unix workstation or terminal. Once you see how easy it is to avail yourself of the information resources that are freely available on computers

in libraries, government offices, universities and other businesses around the world, you'll see how the game is played.

Do an internal benevolent Internet audit. Your company may have a "no Internet" policy, but I can almost guarantee you have employees who have ventured onto the 'net on their own. Recruit them to form your Internet center of expertise. They'll be invaluable in setting corporate policies about Internet usage. They know what the pitfalls are, what the time sinks are and how to avoid them.

Next comes the corporate plan of attack. Appoint someone to be in charge of your organization's Internet access architecture and corporate policies. Authorize Internet access through a well-designed and approved setup. This means that you place fire walls on your Internet servers. Your employees can send and receive mail and access files, but no one can get into your systems. If you're smart, you will place one server beyond your fire wall containing just the information you'd love your prospects, customers and other stakeholders to have access to - information about your products and services, including easy-to-use forms for ordering products and services from you. Then, stand back and watch the orders flow in.

Seybold is president of Patricia Seybold Group in Boston. Her Notes address is Patricia Seybold@PSOCG. Her Internet address is PSeybold(a PSGroup.com.



## The whole is always great Incidentally, in networki

As confusing as it sounds, there truly are two completely opposing ways to look at high-performance networking. One is the big picture, the sum total of your network. Because it's

only by viewing your network in its entirety that you can be sure it's carrying your organization

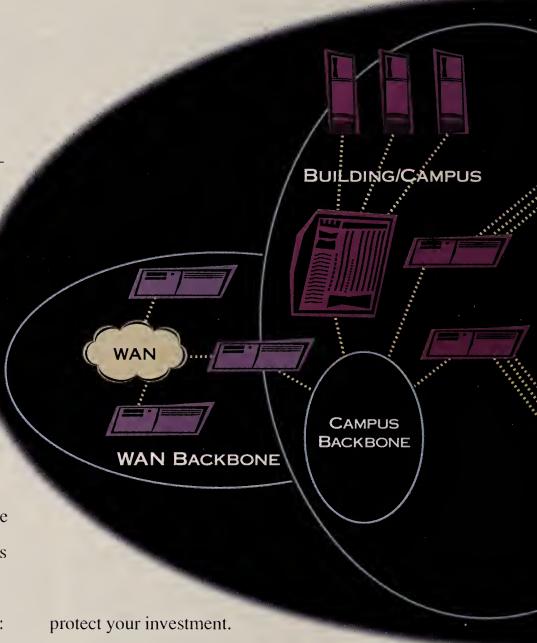
toward the future without compromising the investments you're making today. Conversely, you can't afford to overlook the smallest detail either. After all, unless it responds and even anticipates the needs of the individuals using it, a network has failed to live up to its potential.

At 3Com, we not only recognize the challenges you face, we meet them head-on with solutions that are unparalleled in terms of both sophistication and scope. By providing you with a series of strategic product platforms that encompass the entire enterprise: workgroup, building/campus, remote office, wide-area network, and personal office. Instead of obsoleting your current network, these platforms act as road maps,

guiding you as you upgrade your existing hub and router configurations to whatever level of performance you desire, all the way up to the speed of ATM. Giving

you complete discretion in terms of both when and where you decide to implement them in your organization.

The result is something very compelling: You control network speed, you control the migration path, and you



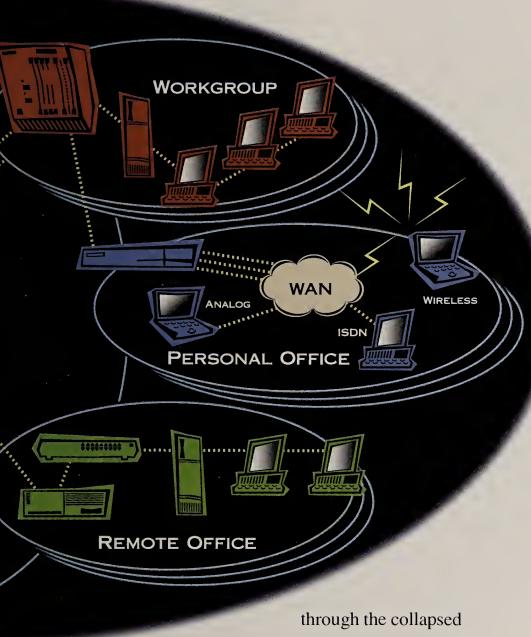
At the heart of this high-performance network is the "collapsed backbone." It concentrates the LAN backbone connections into a single bridge/router,

simplifies the wiring complexity between floors, and centralizes your network's management to help you reduce costs while greatly simplifying administration and support.

Expanding the network then becomes as easy as segmenting the backbone, which means you can solve a bandwidth problem in stages and grow the performance incrementally. Stackable and chassis hubs serve to expand and increase the level of segmentation delivered to users. Traffic is still routed

WAN BACKBONE

# er than the sum of its parts. ng the reverse is also true.



backbone. And all complexity is centralized, where administrative costs are substantially lower.

As your company's growth continues, and more bandwidth is called for, servers with existing Ethernet interfaces can be connected directly to switching hubs. Mission-critical resources, such as servers, can be attached to FDDI concentrators for

REMOTE OFFICE

greater throughput.

Again, complexity is reduced while at the same time performance actually increases.

You'll find,
too, that existing 10BASE-T
workgroups can
be easily migrated to



100BASE-T Ethernet, providing exceptional price/performance and standards-based protection. Multi-service hubs such as the LinkBuilder® MSH™ can support all your different wiring needs: FDDI, CDDI, Token Ring, and 100BASE-T Ethernet.

Should you find your network expanding still further, FDDI building interconnects can be used to build campuswide links between buildings, using NETBuilder II® routers or our LANplex® 6000 switch at the base of each collapsed backbone. And for the greatest reach, ATM superhighways can be created and extended

The result
of all this is highperformance scalable networking at any

to the desktop.

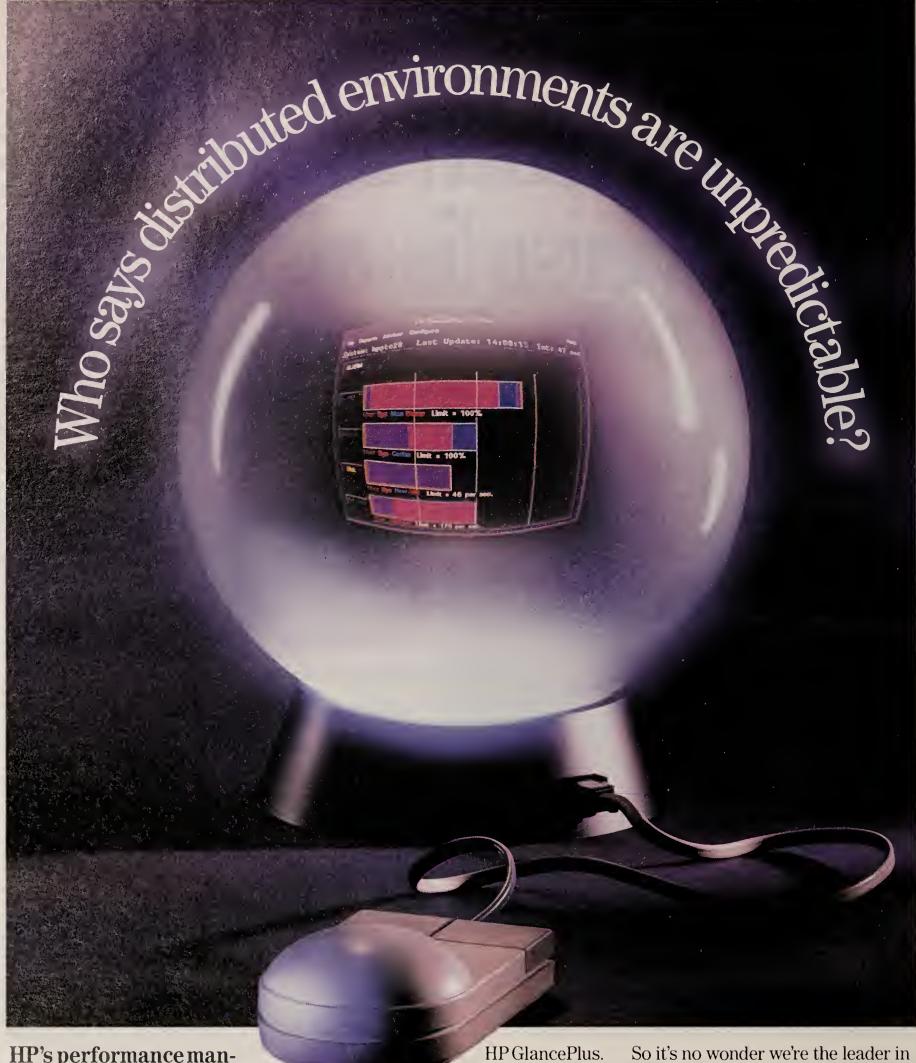


speed, in any location, with full Transcend<sup>™</sup> network management.

To find out about building a whole high-performance network, call **1-800-NET-3Com** for a free white paper. By the way, to find out about just putting together a part of one, the same number applies.



Networks That Go the Distance™



HP's performance management tools show you the future in time to change it.

Today, the way to manage your systems can be crystal clear. Thanks to the vision provided by our performance and resource management tools. Giving you the kind of control previously available only in mainframe environments.

Our family of products provides everything from top-down enterprise overviews using HP Perf View to nitty-gritty system diagnostics with To plan and manage your resources, we offer HP PerfRX and HP Performance Collection Software.

Working together, they help you increase user productivity and maximize system utilization. While reducing management costs. You'll be able to see problems in time to avoid them. Even future needs become predictable.

HP has long played a prominent role in Open Systems management. With HP OpenView, we showed the way to manage integrated networks. So it's no wonder we're the leader in tools for the distributed computing environment.

To see more, call 1-800-237-3990, Ext. 2826 for our free video. The future will look much brighter when you look at it with us. The performance management leader for the distributed age.



©1993 Hewlett-Packard Company

# **Desktop Computing**

# desktop DBMS duo

By Stuart J. Johnston

■ Microsoft Corp. takes another swing this week at dominating the desktop database arena, unveiling a one-two punch of twin database updates.

The company will announce today that Access 2.0 will reach dealer shelves in about three weeks, following on the heels of FoxPro 2.6, which should be available this week, Microsoft officials said.

## Priced to sell

Trying to repeat its earlier suceess in unseating rival Borland International, Inc.'s dBase through low-ball pricing for Access 1.0, Microsoft will price FoxPro 2.6 at \$99 for the standard edition of the DOS or Windows package through June 30. After that date, the price will rise to \$495. FoxPro 2.5 users can upgrade for \$19.95, the company said.

Microsoft will offer a 90-day \$99 upgrade price to Access 2.0 to users of earlier Access versions or its Office applications suite. However, users of competing database products will pay \$129. The list price for Access 2.0 is \$495.

Although the two Microsoft da-

tabase systems are distinct, both incorporate some of the same technologies in their new releases. These include the addition of more wizards — templates that simplify many tasks -- such as one for creating many types of tables.

Other features the two have in common are support for Object Linking and Embedding (OLE) 2.0. Access 2.0 also now incorporates the Rushmore fast search technology that was pioneered in FoxPro.

FoxPro 2.6 provides a Catalog Manager tool that lets database developers manage all database files, such as tables, queries, screens, labels, reports and programs, from a central point.

The update also provides a more automated way to import dBase files, including conversion of screens to a FoxPro format.

### To lure users

"Our big message is that 2.6 is all about making it as easy as possible for dBase users to move to Fox-Pro," said Steven Murch, FoxPro product manager.

In addition, FoxPro 2.6 adds more than 50 new dBase commands to improve compatibility with dBase IV 2.0. A transport

Microsoft, page 41

# Microsoft to deliver New tricks for old PCs

Companies find savings by upgrading instead of buying

By Jaikumar Vijayan

When PECO Energy reviewed its information systems requirements last summer, it decided to try something new. Instead of replacing its aging PCs with newer and faster systems, the

company opted to upgrade its installed base.

The process is still not complete, but the results -at least in terms of eost-justification - have been fairly satisfying. The company has saved an estimated \$40,000 in hardware costs in the past year, according to Linda Abraham, manager of enduser services at PECO, formerly known as Philadelphia Electric Co.

### New lease on life

"Instead of budgeting for brand-new PCs, we decided to find a way to redeploy our older machines through planar board and hard drive upgrades at a reasonable cost," Abraham said. So far,

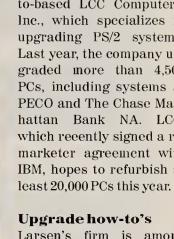
PECO has extended the life of nearly 400 of its IBM PS/2s by upgrading their planar boards to boost power and performance. Another 350 will undergo the same transformation.

Renewal is also a means to protect the asset value of computers, according to Abraham. Upgrade eosts can be budgeted as an operating expenditure instead of a capital expenditure.

The cost of renewing an old PC can be amortized over the approximately three years of extended life gained from upgrading, Abraham

"Not everyone wants to throw away old PCs. Some would like to protect their investments,"

> said Chris Larsen, marketing vice president of Toronto-based LCC Computers, lnc., which specializes in upgrading PS/2 systems. Last year, the company upgraded more than 4,500 PCs, including systems at PECO and The Chase Manhattan Bank NA. LCC, which recently signed a remarketer agreement with IBM, hopes to refurbish at



Larsen's firm is among those companies that re-engineer PC installations by eombining some parts of an existing PC with new components to create a higherperformance system at a

lower cost than a new system.

There are many ways to enhance system performance, according to Larsen. The most common method involves replacing the system board with upgrade boards from companies such as IBM and Cyrix Corp. Other upgrade products include clock-doubling CPUs, memo-

PCs, page 45

# Symantec tries out a new Act

By Michael Fitzgerald

Symantec Corp. has released a new version of its Act for Windows contact manager, designed to work within a networked environment.

Act 2.0 adds several features that users said help them in their jobs, including support for networking, integrated electronic mail and an enhanced calendar and address book.

Users said they were particularly pleased with the network features.

"We're in essence running our office through Act," said Donald E. Brown, president of Fidueiary Associates, Inc., a trust firm in Winter Park, Fla. Act replaced WordPerfect Corp.'s Office package in his business.

Brown said the company has all of its contact information on the networked version of Aet, which lets Fiduciary's employees easily track the history of a particular account. Employees generate most of their correspondence through the integrated word processor in Aet.

Brown said he would like to see more flexible password protection with Act because workers cannot check schedules on-line without logging out of their system and then logging in as another worker.

While this would seem to flout the need for personal security, "if you look at the way offices run...you don't want to have to log out and then log back in as someone else to schedule an appointment for them," Brown said.

# **Network news**

At IDS Financial Services, Inc.'s office in Minneapolis, "We need a client management system that allows us to be networked," said Keith Gasner, a certified financial planner and Act beta tester.

Gasner said IDS, which has 7,000 financial planners, will upgrade from the DOS to the Windows version of Aet, in large part because the Windows version gives the company a networked database.

Early results from the new version showed a productivity gain of three to four times, Gasner

The new integrated networking automatically merges E-mail from a host system to the user on the road. With Act, users can now send and



# **Growth market**

Contact management is roughly a \$60 million market; however, it is growing at a rate of 75% a year, according to Symantec.

# The users

Approximately 30% of Act users use only a notebook computer; 50% of all its users have a fax/modem.

receive messages from Act through Lotus Development Corp.'s CC:Mail and CC:Mail Mobile, Microsoft Corp.'s Mail and services such as CompuServe.

John Russo Jr., group product marketing manager at Symantec, said the product's next version will take synchronization a step further by incorporating automatic database synchronization from a remote workstation. This version is due later this year.

One analyst ealled the new features a signifieant step forward for Act.

"The important thing was to make sure people understood it's not a [personal information manager], and this will let them do that," said Chris LcTocq, an analyst at Computer Intelligenee/InfoCorp in Santa Clara, Calif.

The company also dropped the price significantly, from \$399 to \$279.95. Current DOS and Windows users can upgrade for \$69.95, while users of 1stAct or Act for the 95LX from Hewlett-Packard Co. ean upgrade for \$99.95. A fournode network pack eosts \$799.

Built-in networking support includes Artisoft, Inc.'s LANtastic 5.0, Microsoft's Windows for Workgroups 3.1 and higher and Novell, Inc.'s NetWare 2.11 and higher. The products are shipping now.

# If you're switching from DOS to Windows, your moving crew has just arrived.



# Introducing the Borland® Office 2.0.



Only the Borland
Office integrates
PC/Computing's
three Most Valuable
Products in the
categories you
want most—word
processing, spreadsheets and database.

Moving to Windows<sup>™</sup> can be easy. Especially if you have a lot of help. That's why the Borland Office 2.0 teams up the most award-winning products of all time. And it throws in some extra muscle, too.

# Help with DOS files.

The Borland Office has the best compatibility with your existing DOS files. So you don't have to leave anything behind. Plus, it's easier to work with other people who haven't moved to Windows. You can even switch back and forth between platforms.

# Help learning.

Instead of learning new Windows programs, why not let them teach you? We have "Coaches" to show you how things work. Plus "Experts" and "Macros" that perform complex tasks for you. So you don't have to learn anything at all.



The Desktop Application Director lets you access applications and common tasks at the click of a mouse.

Our Transition Advisor can even teach you the new key commands. Or we can make your WordPerfect® menus and commands exactly like DOS.

# Help sharing.

Unlike other suites, every product in the Borland Office is workgroup-ready right out of the box. So you can share information with your co-workers and receive updated data without any additional hardware or software.

# Call (800) 526-5039.

Call us today for product and ordering information. You'll get more than just software, you'll get a moving crew.



WordPerfect is a registered trademark of WordPerfect Corporation within the United States and other countries. All other brand or product names are trademarks or registered trademarks of their respective companies. © WordPerfect Corporation 1994

# Microsoft duo

CONTINUED FROM PAGE 39

function helps developers migrate their FoxPro code between FoxPro platforms on DOS, Windows and the Macintosh.

Professional editions of FoxPro 2.6 for DOS and Windows are priced at \$695 each. The professional editions include the standard edition plus a runtime distribution kit and a library construction kit that lets developers write C language routines for FoxPro. They also provide an Open Database Connectivity kit for connecting to SQL databases and a set of workgroup extensions for mail-enabling database applications.

Access 2.0, which will be announced today at the Microsoft TechEd conference in New Orleans, features an enhanced version of Access Basic that has most of the features of Visual Basic Applications (VBA) Edition, said Mary Engstrom, group product manager of the Access business unit.

"It's not a superset or a subset of VBA, [but is] about 10% different," Engstrom said. "For example, now you have programmatic control of data definitions."

**Object support** 

Also included in Access Basic is support for OLE 2.0, including application automation — the ability to drive other programs from within Access, or for Access to be driven by other OLE 2.0-enabled programs such as Excel 5.0. Access 2.0 also includes several OLE 2.0 Custom Controls that can be incorporated into users' applications, including a sample calendar, a slider control and a data outliner that lets users look at data hierarchically.

Under the hood, Microsoft has added a lot of other small improvements that define the update, according to Mike Proto, database team leader in the technology planning and assessment group of Pacific Gas & Electric Co.'s client support services department in San Francisco.

Access 2.0 "is more of a consolidation of what's already there [in Access 1.0] than an extension," Proto said. He cited

Plan to Attend:

Plan to Attend:

INFORMATION
SYSTEMS
EDUCATORS
CONFERENCE

EDSIG

June 12-15, 1994
Scanticon Conference Center & Resort
Suburban Denver, Colorado
1-800-488-9204
For more info or to be placed on the conference mailing list

many areas of refinement as reasons why "if you like 1.0, you'll love 2.0."

Among the improvements are the automatic recognition of data types — for example, Access 2.0 automatically recognizes that a Social Security number is a text data type instead of a numerical data type — and an automatic quick sort feature.

Also added to Access 2.0 is support for Microsoft's Office Links technology that, for instance, lets a user create a link to a

word processing document for mail merging from a database automatically.

The update's tool bar also looks the same as Microsoft's other productivity applications, with eight out of the first 10 icons matching, said David Risher, Access product manager.

Access 2.0 either adds or improves 35 wizards and lets a user drag an oftenused query and drop it on the tool bar where it will be available whenever the user wants to execute it; lists of databas-

es display icons to identify what database product created the data. The system also provides support for Microsoft's Cue Cards and IntelliSense technologies.

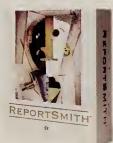
A new version of the Microsoft Office Professional edition, called Version 4.3, will also be available with Access 2.0 included, Engstrom said.

Additionally, an Access Developer's Toolkit, which includes the Access distribution kit and Visual Basic 3.0, will be available for \$495.



# If this was a database report written in ReportSmith, you'd be able to read it.

Introducing Live Data.
The WYSIWYG Approach
to Database Reporting.



ReportSmith is the database reporting and query tool that lets you work with data directly and interactively from your database. We

invented this "live database reporting" approach so that what you see on the screen is what you'll get in the report.

There are no symbols. No mock-ups. No surprises. Just the real thing.

No wonder <u>InfoWorld</u> says, "Its way of showing you your own data during the

KALUMAN INVESTMENTS INC.
124 Mod 55 Seed
There rich have total 2017 125 5544 by 127 125 545 WYOUR ROVESTMENT STATEMENT

BEAUTY OF THE PROPERTY OF THE PROPERTY

report design phase is far more intuitive than any other way of working." Why Windows Sources calls it, "...one of the best report writers we've seen." And why we go so far as to say, "if it's not live, it's dead."

You don't have to be a database expert to create impressive-looking columnar, form, and crosstab reports

and labels in no time – every time.

In fact, our newest version,
ReportSmith 2.0, even has a new "drag & drop" query interface for end-users that requires no knowledge of SQL. Plus OLE 2.0 support, faster performance and over 150 new features and capabilities including loads of customization tools for developers.

We think you'll find our price is rather amazing, too.
We'll even give you a free



runtime. To find out more, call us today.

We'll send you lots of impressive reading about ReportSmith.

1-800-446-3446

# REPORTSMITH

There are report writers. And then there's ReportSmith

ReportSmith, Inc. 2755 Campus Dr., Suite 205, San Mateo, CA 94403 415/312-0770

# TRAPPED IN THE BODY OF THIS TINY SER

This is a story about a small computer engineered to be so dependable, you wouldn't think twice about trusting it with your mission-critical applications. And to be this without filling a

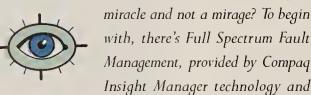
closet, much less a room. If you haven't thought of Compaq as a business-critical platform before, kindly grab your bifocals and

begin. (We'll be cramming lots of information into this ad, which only makes sense, given how much we fit into our ProLiant servers.)

If there's one thing we've learned working with our customers, it's that you're running more and more mission-critical applications on your network. And if your network goes down, your business goes down. All of which should give you a better sense of why we built the Compaq ProLiant servers.

ProLiant is our family of affordable, high-performance and easy-to-manage servers engineered specifically to provide the high availability you need for mission-critical networks. We've designed ProLiant in three different models, ranging from a single-processor configuration to a four-Pentium processor model.

Now, how can you be sure our server is truly a



software that continually monitors over 800 aspects of the server's operating status. (For example, Drive Parameter Tracking checks 15 hard-drive parameters.) All of this information is constantly gathered, analyzed and then used to prevent, tolerate or recover from system problems.

If the performance of a monitored component drops below a specified level, our unique Pre-



Failure Warranty\* kicks in. We'll actually replace a Compaq warranted drive or memory system free. Before it stops working. No

downtime. Ringing cash registers. Happy boss.

Still, no network's perfect. In the unlikely event a problem occurs, our servers exhibit remarkable tolerance. Every ProLiant includes Compaqdesigned hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots

automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

# VER IS A MAINFRAME WITH AN ATTITUDE.



For example, Automatic Server Recovery 2 performance to perform an astonishing array of tasks. Like intelligently restarting the server, automatically correcting a variety of problems, and accessing a telephone pager to contact network administrators.

By now you'd expect us to have rethought uses a historical record of server status and server setup, configuration and OS installation, but you might be surprised by the results. SmartStart is a CD-ROM system that takes the headache out of getting your server up and running. ProLiant includes a CD-ROM drive and bundled CDs of optimized Netware and

other major operating systems. To get hooked up to your network operating system, simply call your dealer for an access code, enter it, answer a few questions, and leave. Minutes later-say, after you've enjoyed a cup of coffee and a jelly donut—you'll return to find an integrated OS fully installed and optimized for increased performance and improved management. And we'll keep you updated via CD when new operating system versions appear.

And finally, to accompany our new line of mission-critical servers, we're introducing mission-critical support. With ProLiant, we now offer extensive analysis, installation and service through our CompaqCare System Partners, a select group of highly trained systems experts backed by Compaq engineers. You can now choose 4-hour on-site warranty response upgrade\*\* direct from Compaq. Again, there's our unique Pre-Failure Warranty. And, of course, all Compaq servers come with a 3-year on-site<sup>†</sup> warranty, and 7-day-a-week, 24-hour-a-day technical support.

All in a surprisingly small box for not a whole lot of money. In fact, a DX2/66 Compaq ProLiant 1000 starts at about \$6000<sup>+</sup>.

Which may help to explain the look your boss gives you when he hears how much money you've saved: stunned admiration. But you'll get used to that. It goes with the territory. If you'd like to receive model, feature and specification information about our ProLiant servers immediately via fax, all you have to do is call us at 1-800-345-1518, select the PaqFax option and request document #4003. On the other hand, if you'd like a brief technical overview of our servers, we can get that to you



even faster. Just turn the page.



# THE COMPAQ PROLIANT MISSION-CRITICAL SERVERS

	ProLiant 1000	ProLiant 2000	ProLiant 4000
Hi	GH PERFORMANCE N	NETWORK SERVERS	
Processor	Intel DX2/66 or Pentium 60MHz	Intel DX2/66 or Pentium 66MHz	Intel DX2/66 or Pentium 66MHz
Architecture	Flex or TriFlex/PC One Processor	TriFlex with up to two symmetric processors	TriFlex with up to four symmetric processors
Network Interface	Up to 12 High-Speed Cha	nnels; NetFlex 2 with Packet B	laster Technology Standard
Standard Disk Controller	Integrated Fast SCSI-	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)	
Storage Capacity	550MB-112GB Internal/external	1050MB–140GB Internal/external	1050MB-140GB Internal/external
Typical Usage	Departmental network services—primarily NetWare	Departmental network application services— NetWare, NT and Unix	Application services for preemptive downsizing— NT and Unix
Transaction Rating	50-150 TPS	200-300 TPS	300-400 TPS
Estimated Starting Street Price‡	\$6,000	\$8,900	\$13,900
Serv	VER DEPENDABILITY	AND AVAILABILITY	7
Management	Second-generation Compaq II	nsight Manager (standard) com assess and report server health	bines with innovative hardwa
Fault Prevention		server status changes in over 80 agement backed by 3-Year Pre-	
Fault Tolerance	Standard support for RAID-le off-line backup processor§; ad	vels 1,4,5; hot-pluggable drive lvanced ECC RAM§	s; on-line spare drive;
Fault Recovery	Standard rapid recovery service even in the event of a critical s	ces automatically return server ubsystem failure	to full operational status
SIMPLI	ICITY, EASE OF OWN	ERSHIP AND SUPPO	ORT
SmartStart		t hardware configuration and sy juration for NetWare, NT or U	
System Warranty	Free Three-Year, On-Site Limi	ited Warranty	
Pre-Failure Warranty	Three-Year, On-Site Warranty fall below preestablished thres	replacement of designated cor sholds	nponents that
4-Hour Warranty Response Upgrade	Optional Three-Year On-Site	Warranty upgrade to 4-hour re	sponse
Technical Support	Toll-free, 7 x 24 technical pho	one support from Compaq engi	neers
CompaqCare System Partners	Highly trained, dedicated, thir comprehensive technical supp	d-party professionals who provort	ide systems maintenance and
QuickFind/PaqFax	Proactive notification and deli updated specification, configu	very of new technical informat ration and settings data	ion/7 x 24 fax response for



# **Tricks for old PCs**

CONTINUED FROM PAGE 39

ry modules, hard drives and vidco accelerators.

"Taking something from a 386DX to a 486 could cost as little as \$295 for a CPU upgrade and around \$1,500 for a system board upgrade," Larsen claimed. A fully upgraded high-level PS/2 system would still cost at least 30% less than a new system, Larsen said.

### **Memory-boosters**

Autotime Corp. in Portland, Ore., has developed a procedure that allows users to increase the density of their memory chips rather than replace them. According to Autotime President Mike Faunce, it is possible to reconfigure the logic of eight 256K-bit chips to form 1M-byte sin-

Inline Software, Inc. has introduced PopupFolder, a utility for the Macintosh that hierarchically displays the contents of all folders and volumes in the Finder application.

According to the Lakeville, Conn., company, PopupFolder also works within an application's open and save dialogs, giving the user immediate access to all files.

PopupFolder requires Apple Computer, Inc.'s System 7 and runs on a Macintosh Plus or higher with 2M bytes of RAM. lt costs \$59.95.

► Inline Software (203) 435-4995

Manugistics Group, Inc. has announced the Windows version of Statgraphics Plus, a PC-based statistical graphics analysis software tool.

According to the Rockville, Md., company, Statgraphics Plus is a true Windows-based application built without reusing code from previous DOS versions.

The product offers integrated, interactive graphics and StatFolio, a system feature that saves and reuses work without writing code or recording macros.

A Dynamic Data Exchange link to popular Windows spreadsheets is included.

Statgraphics Plus for Windows costs \$649 for the Base System and \$399 for cach additional module.

► Manugistics Group (301) 984-5000

# HIRING **ENTRY LEVEL** I.S. TALENT?

Reach 100,000 top students on top eampuses by advertising in Computerworld's annual Campus Edition in October. Deadline: Sept 16

800 343-6474, x201

gle in-line memory modules (SIMM) for as little as \$18.50 and 1M-bit memory chips into 4M-byte SIMM modules for around \$34.

Yet despite the obvious attraction of lower costs, the benefits of upgrading are situation-specific, according to Hugh Hoffman, assistant director of IS at Northwestern Mutual Life Insurance Co. in Milwaukee. "Midlife kickers, if they get to be expensive, don't make too much sense," Hoffman said, referring to upgrades. Factors to be considered are life expectancy of the upgraded PC and the cost of performing the upgrade, he said.

Chris Goodhue, senior analyst at Gartner Group, Inc. in Stamford, Conn., predicted that 10% to 15% of the current installed base of nearly 184 million PCs worldwide will be replaced or unplugged by 1995. Out of this only about 5% will be upgraded, he said.

Joseph W. King, president of Crossroad Partners, a Lotus Development Corp. Notes business partner in Shrewsbury, N.J., and former assistant vice president at Continental Insurance Co.'s data center, said it is not always wise to upgrade systems.

"If one is talking about CPU upgrades, I don't think it makes any sense whatsoever. I have found that they create compatibility problems, especially with OS/2 and Windows, and they tend to make a machine configuration look like nothing OS/2 has seen before."

# The Dual Paper Path **Network Printers** From GENICOM

Load two different forms and switch between them.

Load two identical forms and run longer print jobs unattended.

Park both paper paths and insert a single form.

Ideal for multipart forms and multiuser environments.

Auto Head Gap senses paper thickness to ensure optimum print quality.

### A form-idable pair.

Does it seem like everyone in your office disappears when it's time to load, unload, or reload printer paper? And do you have to reprogram form settings every time you change paper? Well, with GENICOM's two new office-quiet, dot matrix time-savers, you can load two forms at once. And store four different form settings. For reliable, round-the-clock printing there's the 330 cps Model 1220. Or choose the 600 cps Model 3840EP for heavy duty workloads. Each has paper-handling features to print labels and multipart forms with ease. Because at GENICOM, we believe that you shouldn't

run continuously. Your printer should.

# All the right connections.

Talk about working together! Our new dual-path printers get along with all major protocols and support the most popular LANs. Our GeniLink connectivity solutions are available for TCP/IP, Novell<sup>®</sup>, Unix<sup>®</sup> and AppleTalk<sup>®</sup>. And if you need an IBM® twinax or coax printer with an integrated IBM control panel, we have the Model 3940IP.

GSA Schedule approved. © 1994 GENICOM Corporation
All company and/or product names are trademarks
and/or registered trademarks of their respective owners.
The ENERGY STAR's emblem does not represent
EPA endorsement of any product or service.



# Loaded for business.

There's a GENICOM printer for every workload and every workgroup. Dual and single paper path models. IBM-compatibles. Impact and nonimpact. All backed by GENICOM's worldwide, quick-response service network. For more information and a free copy of The Complete Guide to GENICOM Printing Solutions, call 1-800-4-GENICOM ext. 36. In Canada, call 1-800-268-0464.



# The Toshiba T4700C Series

# A notebook so powerful, it breaks the sound barrier.



The Toshiba T4700C Series can run your most intense applications or even help you run a presentation. With its SL Enhanced i486 DX2 50MHz processor, it easily handles graphics-rich programs. The built-in multimedia capabilities let you create and give breakthrough presentations anywhere. And Toshiba's advanced color gives you a choice of either stunning TFT or eye-popping Dynamic-STN dual-scan displays. With so much going for it, buying a T4700C Series notebook is a very sound decision. For a Toshiba dealer near you, call 1-800-457-7777.

*Incredible Sound:* 

An integrated sound system and built-in speaker let you enjoy fantastic sound whenever you want.

The only computer you'll ever need: The optional Desk Station IV, lets you instantly connect to your network, printer, VGA monitor, mouse, and full-size keyboard.

Two separate PCMCIA slots:

A 16mm and a 5mm slot are your keys to expansion, —for modems, storage and more.



A multimedia roadshow: Headphone or external speaker port and microphone jacks make the T4700C Series perfect for presentations.



- 9.5" dia. color TFT-LCD active matrix display
- 256 simultaneous SVGA colors at 640x480 resolution

### T4700CS

- 9.5" dia. color Dynamic-STN
- d ial-scan display
- 256 simultaneous SVGA colors at 040x480 resolution

# **BOTH MODELS**

- 50MHz SL Enhanced i486 DX2
- 8MB RAM expandable to 24MB
- 200/320MB HDD
- Two PCMCIA slots (16mm and 5mm)
- Integrated graphics accelerator
- VL local-bus video
- Built-in microphone
- WAV audio capabilities

- Audio jacks: headphone/speaker, microphone
- NiMH battery for extended life
- QuickCharge battery recharge system
   3.5" 1.44MB floppy disk drive
   BallPoint™ 2.0 mouse with QuickPort™
   MaxTime™ Power Management system
- LCD status icon bar DOS\*, Windows\*, and Windows Sound System" software pre-installed





In Touch with Tomorrow TOSHIBA

LANs SERVERS SOFTWARE FOR GROUPS

# Workgroup Computing

BRIEFS, 48 JETFORM UPDATES FORMS SOFTWARE, 49

# Client/server setup targets big bucks

By Mark Halper

Harvard University will launch in August what it claims is the largest fund-raising campaign in collegiate history, and it will lean heavily on client/server technology to help it meet its five-year, \$2 billion

The star component of the supporting computer system will be a homegrown, front-end application that will provide some 250 fund-raisers with personal and financial information on prospects. It will help the fund-raisers become virtual best friends with half a million individuals identified as having "money to burn."

Chief among the intended benefactors are the targeted 10% elite who make 90%

of total contributions in any fund-raising effort, according to James Conway, Harvard's director of development computing services.

Under Harvard's plan, the cream of that crop, or about 20 donors, will hand over some \$20 million each.

As Conway noted, "To ask someone for \$20 million, you don't just come in and ask for \$20 million. It takes two years to cultivate the relationship."

# All the goods

That's why Harvard is developing a sophisticated tracking and management program that will enable the 250 fundraisers to peer at a computer screen and view encapsulated biographies that will help them get chummy with the university's would-be benefactors.

Screens on Macintosh computers and 486 PCs will tie in to a Sybase, Inc. database housed on a Sun Microsystems, Inc. 690 server via Ethernet and TCP/IP links.

The screens will not only display fundraising basics, such as phone numbers,

addresses and donation history, but also fund-raisers outfit with invaluable bits of personal information that is many a salesperson's dream.

With a glance of an eye or click of a mouse, information such as the subject's favorite drink, names of spouse and children, hobbies and activities, golfing buddies and favorite vacation spots will be available to help a fund-raiser keep the conversation moving along in an effort to win the good graces of the candidate.

This information is entered initially by the fund-raising staff, which over time creates a comprehensive compendium of personal data to help Harvard clinch its contributions.

"It includes assistants' names because for world leaders, you're dealing with their secretaries," Conway said.

What's more, roughly 20 staffers will constantly feed the system with data culled from public sources such as Securities and Exchange Commission filings and real estate sales. Such data will help fund-raisers size up the pot of gold available to Harvard from any one prospect.

Included in the database arc reports of conversations, meetings and outings with the candidate. And if the candidate has received a thank-you letter from the university president, the system takes note to prevent the donor from receiving the same letter in the future.



Harvard's James Conway: 'To ask someone for \$20 million, you don't just come in and ask for \$20 million'

The system includes a link to a source of highly likely prospects, the Harvard Alumni Association, and keeps tabs on the whereabouts and financial wherewithal of Harvard graduates.

"Once you're a Harvard alum, it's very hard to get lost," mused Philip Gow, who is now president of Renaissance Information Systems in Cambridge, Mass. While at Harvard, he was a lead designer on the system.

Among other purposes, all this information is intended to let the cadre of fund-raisers know that a particular indi-Harvard, page 48

# Harvard central

he August campaign at Harvard University will mark the first step toward an expected centralization of many business and computer activities that have long been scattered among the various colleges.

A university information technology team is currently investigating technology that would support the centralization of finance and human resources operations, according to James Conway, Harvard's director of development computing services.

The leader of that project, Ann Margulies, is evaluating Microsoft Corp.'s Windows NT and Unix as options, Conway said. Margulies did not return phone calls requesting information on her projects.

Conway said the shift began at Harvard soon after Neil Rudenstine took over as president of the university in the fall of 1991 and supported centralization in a marked shift from his predecessor, Derek Bok.

Conway's group in the past has supported fund-raising for the liberal arts school, Harvard College. During the next year it will add support for Harvard's medical, divinity and design schools and will tie in to the president's office, the governing board and the Harvard Alumni Association.

Harvard's law school will remain on its own fund-raising system, Conway said. He declined to elaborate.

-Mark Halper

# IBM expands Ethernet, Token Ring offerings

By Stephen P. Klett Jr.

IBM unveiled a slew of products last week aimed at improving users' connectivity, bandwidth and management capabilities enterprisewide.

While most of the hardware products focused on Token Ring, analysts singled out a low-end Ethernet switch as the highlight of the announcement.

The first in a family of Ethernet switches to debut from IBM, the EtherStreamer Switch provides a dedicated path for up to eight devices or LAN segments. When combined with a full-duplex network adapter card, such as IBM's Ether-Streamer adapter, the \$4,800 switch will support simultaneous, two-way 10M bit/ sec. data transmission with a network

server. This strategy can be a cost-effective interim strategy for users who are experiencing a bandwidth pinch until mature, high-speed networking products are available.

### **Steep competition**

Observers said it was critical for IBM to come out with an Ethernet switch at this time in light of fierce competition in this market segment.

"IBM is really trying to get their LAN house in order here — they haven't been a market leader for the last five years, and they're trying to catch up," said Tom Nolle, president of consultancy CIMI Corp. in Voorhees, N.J. Nolle said the switch was a welcome alternative to fullduplex Token Ring — IBM's previous strategy for boosting bandwidth in shared-media LANs — which is expected to be too costly to compete with comparable Ethernet products.

Laura Deets, LAN manager at Aon Specialty Group, a Token Ring shop in Chicago, agreed. "It's an attractive option should we decide to move to Ethernet when installing new LANs in the future, which is a distinct possibility due to [Ethernet's] lower cost," she said.

The following products were also announced by IBM last week:

• AutoLANStreamer MC 32 Adapter: A full-duplex-enabled Token Ring adapter that will automatically determine and set the correct speed of new workstations added to the network. Cost: \$765.

•PCMCIA adapters: For Token Ring

and Ethernet networks at prices starting at \$495 and \$225, respectively.

·AIX Router and Bridge Manager/ 6000: A router management software package that supports Advanced Pecrto-Peer Networking and Data Link Switching. Cost: \$6,995.

•8229 Token Ring Bridge: A replacement for the 8209 Token Ring/Ethernet bridge that can provide a connection between two remote Token Ring segments at up to T1 speeds. Pricing starts at \$564.

•Frame Relay Bridge/DOS: Provides source-route bridging between DOSbased workstations on remote Token Ring segments over a frame-relay link.

•Route Xpander/2 routing software: Added support for X.25 and IPX.

# Harvard

CONTINUED FROM PAGE 47

vidual has been carmarked for a top-echelon contribution.

"One person can't go in and ask for \$10,000 before someone else goes in and asks for \$20 million," Conway observed.

The venerable educational institution is using a computer from a venerable minicomputer line — Hewlett-Packard Co.'s proprietary HP 3000 — to anchor transactions for the system.

Conway explained that the HP 3000 Model 987 will process gifts and then feed updated information to Sun's Sybase database through a file transfer protocol connection.

Harvard has been an HP shop for years and is using the 3000 so it will not waste existing technology, he said.

Harvard chose the Sun servers over HP servers two years ago because HP machines at that time were twice the price of comparable Sun computers, and HP salespeople were unresponsive, Conway

"I told HP the job was theirs to lose, and they did," he recalled.

The dcsktop computers will use Blyth Software, Inc.'s Omnis front end tied to the Sun through a TCP/IP network.

One of the major design challenges, Gow said, was to decide how to divide the labor procedures between the front-end Omnis program and the back-end Sybase application.

"As a rule of thumb, if it's a process that happens all the time, we'll use it on Sybase, and if it's particular to a specific query, like a guy with blue eyes and a dog named Joe who gives so many dollars, we'll put it on Omnis," Gow said.

# Learning client/server

Gow and Conway both recalled another major challenge: getting Conway's staff of about 30 information systems workers, who were accustomed to working on terminals that access the HP 3000, to work in a client/server world.

To help overcome resistance, Conway said, he has been sending his staff to client/server conferences and seminars.

Workers' attitudes are changing, but slowly.

"Some of them still refer to Macs as terminals," Conway said.

# Briefs

# Tuxedo gets enhanced release

Novell, Inc. announced Tuxedo Version 4.2.2, an enhanced release of its Tuxedo transaction monitor and client/server middleware product. Tuxedo now supports Novell's IPX/SPX network protocols. Future versions will support Novell's NetWare Loadable Modules (NLM), NetWare LAN software and Novell's AppWare application development product, the vendor said. Tuxedo 4.2.2 also supports the development of client/server applications with Gupta Corp.'s SQLWindows and Powersoft Corp.'s PowerBuilder.

# **NLMs** to run on PowerFrame

Network Specialists, Inc. and Trieord Systems, Inc. announced that Network Specialists' Balance, Redundancy, RouteOff and NetBIOS-Off NLM will run on Tricord's PowerFrame superservers. The NLMs were designed to improve server performance and fault tolerance.

# **ICL** announces servers

ICL announced 25 servers, priced from \$4,100, that were co-developed with its corporate parent, Fujitsu Ltd. The ICL servers are based on Fujitsu's SPARC RISC chips and Intel Corp.'s Pentium. Users can choose between running Unix System V Release 4.2 and SCO Unix on SPARC machines and running Microsoft Corp.'s Windows NT, Novell, Inc.'s NetWare or IBM's OS/2 on Pentium machines. Shanker Trivedi, product marketing manager for ICL's server systems division, said the firm will build up its U.S. sales force because ICL's installed base is in Europe and Asia.

# **Certification granted**

Core International, a unit of Aiwa Co., said its LAN Array and MicroArray redundant arrays of inexpensive disks (RAID) have been certified for compliance with the technical guidelines set by the RAID Advisory Board vendor group. The Core products support RAID Level 3 and 5 capabilities and are marketed for use with LANs and midrange systems.

# Dodge gets new COO

Steven Wright has been named president and chief operating officer of The Dodge Group, a Waltham, Mass., developer of financial client/server software. Wright, who will initially manage The Dodge Group's domestic and international field operations, has been president and COO at Landmark Systems Corp. in Vienna, Va. Frank Dodge, the group's founder, will continue as chairman and chief executive.

IMPL Account Flavorers Spring (CRIS) of Circles Accounting Sprine (CRIS) in Distallation Accounting Management Sprine (CRIS) in Distallation Accounting Management Sprine (CRIS) in Distallation Accounting Management Sprine (CRIS) in CRIS (CRIS) in

# IN CASE THESE 20,000 REASONS TO CONSIDER AS/400 AREN'T ENOUGH,

Right now you can finance selected AS/400° models for as little as 1.9%. Which may be as good a reason to consider the AS/400 as its 20.000 ready-to-run applications. But, while the AS/400's list of virtues goes on forever, this deal won't. Install a new AS/400 9404 or 9406 F model, or applications at 9404 or 9406 F model by July 18th, and you can finance for as little as 1.9%. This rate also applies to the operating

Fig. 19 . Fig. 19 dil lating financing option 19 percent applies to best credit rating 36-month term. Restrictions may apply Offer may be withdrawn at any time. IBM and AS/400 are registered trademarks.

# JetForm adds client/server capabilities

By Lynda Radosevich

Users looking to automate the flow of electronic forms over a LAN said they were interested in major enhancements to JetForm Corp.'s electronic forms software that add several client/server fea-

The Waltham, Mass., company said it began shipping JetForm 4.0 last week. The updated version includes the forms design and filling software of its 3.1 release and adds server-based administration and workflow capabilities, electronic-mail integration and access to SQL and other databases. These features improve the product's suitability for building distributed forms applications and automating workflows across LANs and wide-area networks, according to users.

"We're downsizing applications to the PCs driven mainly by Oracle databases," said John Coon, a JetForm 4.0 beta tester and software engineer at a nuclear generating station in southern California. "Having the ability to access and process that information using electronic forms is very significant to our downsizing strategy.

The JetForm Design package includes

Open Database Connectivity drivers that enable programmers to link fields in the electronic forms to fields in Oracle Corp.'s Oracle, Borland International, Inc.'s dBase and Paradox, IBM's DB2 and other SQL databases.

The server software, which used to just issue print requests, now includes a forms-tracking database, automatic forms faxing capabilities and a printer module that will issue forms printing commands to a remote printer via E-

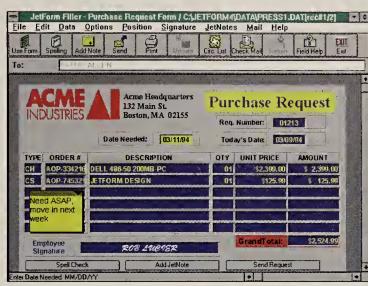
Additionally, the forms filler software comes bundled with imaging software from Watermark Software, Inc. and Object Linking and

Embedding 2.0 support that lets users embed other applications or images into

However, Coon said JetForm 4.0 is cumbersome to install on a network and

that he had to write his own loading program to simplify the process for PC us-

For the Pacifica Hospital in Huntington Beach, Calif., the enhanced JetForm soft-



The enhanced JetForm 4.0 software wilt be positioned as a low-cost workflow alternative

ware will be part of a low-cost alternative to what might otherwise be a half-million dollar information system, according to material director Jeff Johnson.

The hospital already uses JetForm to

keep electronic inventories rather than paper-based forms. Now the hospital plans to build a forms database that lets nursing floors, hospital administration, the emergency room and other departments share information using JetForm forms routed via Lotus Development Corp.'s CC:Mail.

"Two years ago, you couldn't even dream of doing this on a LAN," Johnson

Pacifica Hospital will save an estimated \$5,000 to \$10,000 off its \$100,000 per year printing costs by creating, storing and distributing forms electronically.

### The right package

Although he looked at other LAN-based forms packages, including one from Microsoft Corp., they did not have the same combination of forms design and database access features that JetForm does,

All three JetForm 4.0 components are shipping on Windows. DOS and Macintosh clients and Unix, Microsoft's Windows NT and OS/2 servers will ship later this year.

JetForm Design is priced at \$495, Filler at \$129 per user and Server at \$795 for five users.



# HERE'S 1.9 MORE.

system and other eligible devices when acquired at the same time as the AS/400. Remember, this is a limited time offer from the IBM

Credit Corporation. Call 1 800 IBM-CALL, dept. 412, or contact your local IBM marketing representative.

If you'd like to hear about all of the other reasons to consider an AS/400, eall soon. There's a lot to talk about.



# Don't let your network outgrow your ability to manage it.



**BANYAN**On Enterprise
Network
Services

ust because your systems coexist, doesn't mean they cooperate. The bigger they get, the more you have to manage. More people, more training, more costs. That's because most of today's "enterprise solutions" are really afterthoughts to a workgroup strategy. They were never meant to scale up.

Unless you have the luxury of starting over — fat chance — you've got two choices: Live with chaos, knowing it will only get worse, or find a way to tie all your hardware, operating systems, and applications together.

Something more than just communication; a solution that lets everything run under a single management paradigm, with a single, seamless system view for users and administrators.

# It's not an impossible dream.

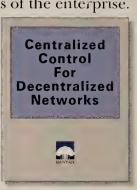
In fact, all it takes is Banyan's Enterprise Network Services (ENS.)

ENS works with your installed NOS or open UNIX environment to provide consistent mechanisms for managing applications and user populations — including naming, security and configuration. So a small team of network administrators can keep a large, growing network operating smoothly and efficiently.

In effect, ENS buffers users and administrators from the underlying network complexity. The software enables you to easily assign servers, and update profiles, and it remembers where every service is located. With ENS, all network resources are identified by a convenient name that stays the same no matter where the resource is moved, or what new resources are added. You can make enterprise-wide changes from a single PC or workstation quickly and easily. To the user, changes in the physical configuration are completely transparent.

Best of all, ENS is a solution that works with what you have today. There are Banyan ENS products for most popular networking environments, including NetWare, SCO UNIX and HP/UX; others are soon to come. ENS is also at the heart of the Banyan VINES network operating system — an open, distributed computing environment developed especially to meet the needs of the enterprise.

Whichever way you go, Banyan's Enterprise Network Services deliver bottom line benefits that enhance your existing technology investment,



Call 800-828-2404.
Ask for your free copy.

and make your network easier to use and to manage.

# Believe it or not, you can get there from here.

To find out more about enterprise networking with Banyan, call us toll-free at 1-800-828-2404, or contact your Banyan Premier Network Integrator.

Banyan and the Banyan logo are registered trademarks, and ENS and the ENS product mark are trademarks of Banyan Systems Incorporated. Other trademarks are property of their respective owners.

BANYAN®
1-800-828-2404

Reduce network management costs by as much as 70%.

NOVELL TO BEEF UP NETWIRE, **52**HUGHES ADDS ROUTING TO HUB FAMILY, **52** 

# X.500 has promise but is no panacea

# Users consider standards compliance a low priority

By Lynda Radosevich

Corporate users are dissatisfied with current directory service products but are not yet confident enough in the X.500 standard to base their purchase decisions on it. That is because X.500 does not promise to solve integration, management and application access issues, according to a recently released study.

### Slow to eatch on

"It's new, it's expensive to implement, and it's not yet clear to users that it's the best solution," said Nina Burns, president of consultancy Creative Networks, Inc. in Palo Alto, Calif., and author of the report.

X.500 is an international standard for



Source: Creative Networks, Inc., Palo Alto, Calif.

coordinating different directory services across distributed systems. While vendor compliance with X.500 promises to help make their products' name and address services easier to integrate, the standard is not very well implemented and does not yet carry much weight with users.

"I think we'll see multiple directory structures for 10 years," Burns said.

Corporate users are most concerned with setting up messaging systems that are easy to use, reliable and secure. Many companies put standards compliance low on their priority lists, Burns added

Meanwhile, to deal with integrating proprietary directories, users are turning to message and directory switches

> such as those from Soft-Switch, Inc., Worldtalk Corp. and Alisa Systems, Inc., she said.

### Which came first?

It is unclear whether the current lack of user interest in X.500 services stems from the lack of X.500 products and tools, or whether the missing products and tools stem from a lack of user demand.

Whatever the case, major electronic messaging vendors are preparing to comply by changing their proprietary addressing and directory schemes to more closely match the hierarchical architecture of the X.500 standard

Those vendors include Novell, Inc., Banyan Systems, Inc., Lotus Development Corp., Microsoft Corp. and Soft-Switch.

That could coincide with customers' time frames, as X.500 creeps up to the top of user lists over the next two to four years, Burns said. Users will implement X.500 as they migrate to newer wares that comply with the standard.

"It's not important to us that a directory service is pure, 100% X.500, but if I can get as close to it as I can, I can avoid some maintenance issues," said Don Price, a technologist at Texaco, Inc. in Tulsa, Okla.

Interest in X.500 will likely follow a path similar to that of the X.400 standard for routing messages. The X.400 standard was published in 1984 and updated in 1988.

However, in 1994, LAN electronic-mail vendors such as Lotus and Microsoft still have not deliv-

ered native X.400 messaging transports that do not require gateways to exchange messaging with other X.400 systems.

"We think the same thing is going to happen with X.500 products. But that doesn't mean you don't do something because all the commercial tools aren't there," said Gene Hughes, a computer specialist at the U.S. Department of Energy in Washington.

### Going agencywide

Hughes said he hopes to set up an agencywide directory service based on X.500 in the next 12 to 18 months. The

A survey of 50 large companies shows Notes and Soft-Switch Central directory services leave room for improvement Banyan's Street Talk 4.33 Microsoft's Global Address List 4.20 Lotus' CC:Mail 3.75 Microsoft's Mail 3.56 TCP/IP Domain Name Service 3.31 Digital Equipment Corp.'s Directory Services 3.29 Lotus' Notes 3.17

Satisfaction not guaranteed

Source: Creative Networks, Inc., Palo Alto, Calif.

Soft-Switch's Soft-Switch Central

service will include E-mail addresses and other information on the 160,000 employees, researchers and contractors with whom the department works.

SCALE: 0 IS LEAST SATISFIED AND 5 IS MOST SATISFIED

3.06

Initially, the department will use X.500-like switching software from Worldtalk to integrate Unix, minicomputer and LAN-based E-mail directory information.

Also, the department will likely write its own user application programming interface so users can access an external X.500 "white pages" directory project. That project is piloted by Lawrence Livermore National Laboratory in Berkeley, Calif., Hughes said.

# **Computer security**

# SecurID keeps passwords a'changing

By Gary H. Anthes

■ According to alerts put out by the Computer Emergency Response Team at Carnegie Mellon University, thousands of computer passwords have been stolen recently by Internet interlopers, and millions more are at risk.

Passwords represent the Achilles' heel of computer security. Some passwords are easily guessed; others are subject to capture as they travel over networks; still others are left carelessly around offices, perhaps taped to the bottoms of keyboards.

Users have taken precautions ranging from instituting corporate policies that mandate the use of hard-to-guess, frequently changed passwords to using "fire walls," specialized computer gateways with security filters and other protective measures built into their software. One solution uses randomly generated passwords that are used just once. (See related story page 28.)

### A password a minute

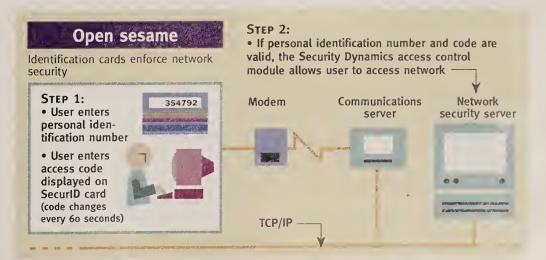
Security Dynamics, Inc. in Cambridge, Mass., has implemented the latter concept in its SecurID smart card, a credit card-size device that computes and displays a new, unpredictable six-digit password each minute. A corresponding feature is implemented in hardware or software on a host or network server, so the user card and the host machine always agree on what password is valid for users at any moment. Clocks in the card and the access control hardware are

synchronized to Greenwich Mean Time.

In addition to the security the extremely short-lived passwords offer, the Secur-ID system adds another layer of security

in the form of a secret personal identification number (PIN), which the user enters with the password. If the card is lost, it is unlikely that an unauthorized user will be able to supply the correct PIN. Security Dynamics said the odds of defeating SecurID are less than one in 14 billion.

SecurID, page 52



# Novell increases NetWire support

**An abundance** 

Novell originally

expected 30 to 40

applicants for the

systems operator jobs,

from which it hoped to

get enough quality

people to boost total

systems operator

numbers to 20 or 30, a

company manager

said. Instead, Novell

has had some 600

applicants, so the final

number of operators

may be larger.

By Elisabeth Horwitt

Novell, Inc. plans to beef up support for NetWire, a group of CompuServe forums where users ask one another and designated systems operators for help

solving day-to-day NetWare problems and get information about recent Novell products.

The vendor recently put out an eleetronic message on NetWire asking users who are interested in becoming systems operators to get in touch.

Novell currently has 12 to 15 of these systems operators, who are users with experience in one or more of its key offerings. They monitor and respond to eomplaints and questions posted on the CompuScrve NetWire forums. Systems operators who encounter problems outside their expertise ean contact Novell technicians, who also monitor the forums occasionally, said Jan Newman, Novell's senior vice president of systems, service and support.

### More support and expertise

Novell's plans to strengthen systems operator support involve increasing the number of operators and ensuring they have expertise in product areas that are important to customers but are currently undersupported, Newman said.

One such area is the AppWare family of client/server application development tools; another is NetWare eonnectivity products such as NetWare/IP and Net-Ware for SAA, which puts NetWare elients in touch with IBM SNA hosts, he added.

As expected, eustomers said they wholeheartedly support a beefed-up NetWire. "Better support on Net-

Wire is key to LAN administrators, given that the CompuServe forums provide one of the few viable ways they ean get help with day-to-day nctwork problems," said Ed Hiller, a data processing supervisor at Little Rock Wastewater Utility in Arkansas.

### Time-consuming and expensive

While Certified NetWare Engineers can get direct Novell teehnieal support over the telephone, others "are asked to get out their eredit eards and pay \$100 per ineident," Hiller said. Sometimes, he added, users "get shuffled around a lot from one support person to another" before the problem is solved.

While Novell does not pay its designated helpers, it does offer certain incentives, including free admission to one of the yearly Interop, Networld or Brainshare conferences and free prerelease software in the areas the systems operator actively supports. However, it seems likely that many operators do their work for the joy of it; indeed, there are many self-anointed, unofficial helpers who prowl the forums and respond to their

colleagues' cries for help.

Contrary to a recent press report, Novell is not scaling back direct support from its technical people on NetWire, Newman said. The vendor is in the process of creating a formal escalation process by which systems operators can contact layers of Novell technical people, he said. The total number of Novell technicians aeeessible through this process will actually be

Novell is one of a number of networking, software and system vendors that sponsor forums on Compu-

### **ISDN** interfaces

# Combinet unveils first ISDN LAN bridge

By Ellis Booker

One of the many obstacles users have tripped over on the road to Integrated Services Digital Network (ISDN) has been finding the terminal devices needed to hook up to it.

Earlier this month, Combinet, Inc. in Sunnyvale, Calif., announced a first: an ISDN LAN bridge that includes a built-in ISDN NT1 interface. The NT1, or Network Termination 1, unit aets as the interface between a conventional two-wire phone line and a four-wire ISDN line.

 $A ee ording to Combinet, the \, Everywhere \, 160 \, will \, eliminate$ the need for users and small businesses to purchase separate NT1 equipment and reduce their overall equipment eost by roughly \$200.

Analysts said sluggish ISDN line sales are the reason more vendors have not integrated NT1 eapabilities into their eore products.

But Jay Batson, a senior analyst at the Network Strategy Service of Forrester Research, Inc. in Cambridge, Mass., predicted a "rebound" in the popularity of ISDN with an emphasis on remote LAN aeeess for individuals and small branch offices.

"I wouldn't be surprised to see ISDN eustomer premises equipment vendors growing two times to four times annuallyfor a few years," he said.

In faet, AT&T Network Systems introduced in February a two-port ISDN adapter packaged with an NT1. The Express-Route Digital Adapter 2000 sells for \$850. AT&T also released a new, shirt-pocket-size NT1 unit, the in-line NT1 L-230, for \$230.

Combinet's Everywhere 160 bridge, which supports several LAN protoeols, including TCP/IP and Ethernet, sells for \$1,190. An aeademie discount is available.

# Hughes adds routing to hub family

By Stephen P. Klett Jr.

Hughes LAN Systems, Inc. jumped into the turbulent "superhub" market last week, unveiling integrated routing modules for its Enterprise Hub family. Analysts said they were surprised by the announcement because Hughes is focusing on routing capabilities right out of the gate instead of on switching functions like its hub rivals.

Observers also said the company's \$160 per port entry price is currently the lowest. Ilughes' move follows next-generation technology announcements made by Cabletron Systems, Inc., SynOpties Communications, Inc. and Chipcom Corp. in the past six months.

However, while Hughes is positioning the Enterprise Ilub for the wiring closet rather than the collapsed backbone the playing field of high-end routers observers said the routing capabilities may add to the confusion in the market over where the line between hub and router falls [CW, Feb. 14].

Hughes, however, is adamant that it is trying to complement routers rather than compete with them.

We're trying to help users get more performance out of their routers," said Bobbi Murphy, vice president of marketing at Hughes in Mountain View, Calif.

For example, she said installing the router modules in the wiring eloset will reduce congestion on eollapsed backbone networks and improve network performance, extending the life of the backbone router.

## Plenty of protocol support

The router modules, codeveloped with Wellflect Communications, Inc., support an array of protocols, including X.25, frame relay and point-to-point at speeds of up to 2M bit/see.

Each module can support up to four interfaces, allowing users to mix Ethernet, Token Ring, Fiber Distributed Data Interface (FDDI) and Asynchronous Transfer Mode (ATM) routing in a single hub

SynOptics and Cisco Systems, Inc. recently halted a similar joint development effort, citing low market demand and control issues.

Hughes' Ethernet and FDDI modules are slated to ship in August starting at \$7,495. Token Ring and ATM modules will ship in November starting at \$6,495.

All modules will include an embedded Simple Network Management Protocol agent and dedicated management processor. Hughes said it plans to unveil switching modules as well by year's end.

# SecurID

CONTINUED FROM PAGE 51

Greenwich Associates, a financial market research firm in Greenwich, Conn., had its network broken into several times last year by intruders who dialed in and guessed passwords. The mischief makers, possibly including a former emplovee, erashed machines, deleted files and did whatever they could to keep the eompany from doing business, according to Mark Sirota, systems and network manager at the company.

Now Sirota's LAN, which consists of 65 Sun Microsystems, lne. workstations and 100 PCs, is proteeted by SeeurlD. Twenty employees and data vendors use the eards to dial into a Security Dynamies Access Control Module that acts as a secure gateway to the LAN.

The access control hardware and software and smart cards cost about \$12,000, Sirota said. "It's definitely not cheap, but eompared to being down for half a day at a time, it pays for itself

pretty quickly."

About 3,000 Glaxo, Inc. employees use SecurID cards around the world to dial into IBM mainframe and Digital Equip-

> ment Corp. VAX minicomputers at the pharmaceutical company's facilities in Research Triangle Park, N.C. Glaxo also has Security Dynamies software installed on a fire wall system that aets as a security guard between the Internet and Unix boxes, said Chuck Ryan, manager of information technology security.

### "The vulnerability was due to the fact that

Reusable is out

most computer systems...employ reusable passwords. There was no exposure for systems which employed... advanced methods such as tokens or smart cards," said F. Lynn McNulty, associate director for computer security at the National Institute of Standards and Technology. He addressed Congress last week on a recent outbreak of "password sniffing" on the Internet.

# **Tradition is eracking**

"Dialing in with traditional user names and passwords is easily crackable," Ryan said. "That puts a lot of pressure on to look at logs every 24 hours, but that is not real-time security." Setting up new users and replacing SecurlD eards, which are programmed to expire every three years, is "a piece of eake," he added.

Security Dynamics' access control software costs

\$1,950 for Unix-based servers and \$17,000 for MVS or VMS hosts. SecurID cards average \$50 each or about 5 cents per user per day, the company said.



IS ONE THING.



The solution is to work with a company that knows how to take your equipment and make it work for you. A company that knows what's ahead so you won't get left behind. A company that understands how to build a network with the latest routers, hubs and structured cabling systems that will grow with you. Today, the question isn't just about equipment. But who can you trust with the know-how to bring everything in your network together?

# KNOWING HOW TO USE IT IS ANOTHER.

Anixter. Nobody knows networking like we do. It starts by working with the leading manufacturers to design a network perfectly tailored for you. Making sure it stays that way. And supporting it with technical expertise from people who really understand your network. For cabling systems, networking products and the know-how to get you exactly what you need, exactly when you need it, there's only one place to set your sights:

I ROOLANIYTED

ANIXCER

For years, EMC has been the performance leader in disk

introducing the 4200-2S, which utilizes high performance

3.5" HDAs. And by integrating an

enhanced channel adapter, we've



measurably boosted the 4800's

performance. That means improved speed, availability,

and efficiency. For more information

on our enhanced Symmetrix 4000 series of ICDA,

call 1-800-424-EMC2, Ext. LM68C.



storage systems. And now,

with the introduction of the

enhanced Symmetrix

4000 series of Integrated Cached

Symmetrix 4000 Series ICDA

Disk Arrays (ICDA®), we're pulling

ahead of the competition once again. We've doubled the

capacity of the Symmetrix 4200 by



# Our enhanced Symmetrix 4000 disk storage series is leaving the competition behind.

# Gradient strategy may face uphill climb

IS officials weigh value of license manager

By Craig Stedman

■ Gradient Technologies, Inc.'s plan to develop a version of its software license manager for end users earned a guarded reaction last week from several information systems executives, who said they are interested only if the price is right.

License managers, which control access to applications by issuing "keys" to users, are becoming important as software vendors try to ensure that their products are used only by licensed users. They also give IS shops a mechanism for automating such tasks as software planning, distribution and usage tracking, analysts said.

A license manager "does a lot more than merely comply with the license," said Bill McNee, vice president and software asset management service director at Gartner Group, Inc. in Stamford, Conn. The technology should enable companies to get a firmer grasp on their software needs and avoid paying for more licenses than they need, McNee added.

Thus far, however, license managers have been marketed to software and system vendors, which usually include them in products at no extra charge. Convincing IS

officials that the technology is something worth paying for may be tough for Gradient, which expects to ship the end-user version of its Ifor/LS license manager in the fourth quarter [CW, March 14].

"We certainly want to watch our liability [for misuse of software], but I'm not sure how much I'm willing to pay to keep myself honest," said James Matsey, corporate director of IS at Reynolds Metals Co. in Richmond, Va. "It would have to be fairly low-cost for us to consider doing it."

"There would have to be some very strong economic incentives because my users would scream and yell the first time they couldn't get into an application," said Tod Dixon, vice president of information resources at Northeast Utilities, an electric company in Hartford, Conn.

Dixon added that he has negotiated unlimited site licenses with most of the major application vendors that Northeast Utilities buys from, including Microsoft Corp. and WordPerfect Corp. Those deals are already saving the utility "a great deal of money," he said.

MeNee acknowledged that while software vendors have an obvious financial interest in using license managers, "it's another thing to get user acceptance." He noted, however, that the cost of a license manager would not be an entirely new expense because many customers currently pay for software inventory and auditing tools that they would no longer need.

Pricing for the end-user version of Ifor/LS has not been finalized, said David Zwicker, vice president of sales at Gradient in Marlboro, Mass. The product will be pitched as a tool for adding customized license management capabilities to applications that do not have them built in by their vendors, he added.

The licensing libraries that software vendors put in their source eode will be replaced in the end-us-

The user sell

Gartner Group analyst Bill McNee said he expects license managers to be included in virtually all software applications within five years. "It's important to start selling this to users so they get involved and accept this willingly rather than on a confrontational basis."

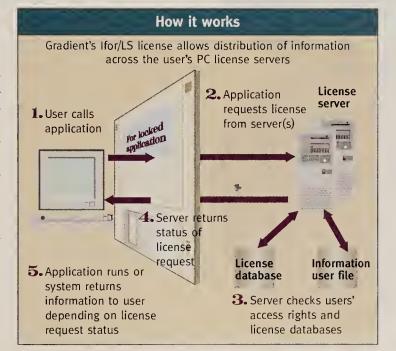
er product by a "wrapper" program that system administrators would incorporate into applications via a graphical user interface screen, Zwicker said.

### Scaling security

Besides the wrapper technology, the other major difference from the vendor version of Ifor/LS will involve security. The end-user software will have "emasculated" security compared with the existing release to prevent users from becoming too familiar with the full security features, Zwicker said. "We want to keep those to software developers to avoid any hostile attacking of them" by users, he noted.

The company is trying to develop a lesser security hurdle that will still be "high enough so that someone cannot inadvertently get around it," Zwicker said. It would be up to individual customers to set guidelines and policies to deal with users who circumvent the license manager, he added.

Gradient plans to support the end-user software on Windowsbased PCs and Unix platforms from Hewlett-Packard Co., Sun Microsystems, Inc., Digital Equipment Corp. and IBM, according to Zwicker. A specific release schedule will be decided during betatesting, scheduled to start in late summer or early fall.



# Informix surges ahead with OnLine 7.0

By Kim S. Nash

Informix Software, Inc. shipped its first true multiprocessing database early this month to little fanfare from mainstream Informix OnLine users, despite the product's strides in parallel technology.

OnLine 7.0 sports Parallel Data Query (PDQ), a feature cobuilt by Informix and Sequent Computer Systems, Inc. that automatically splits complex end-user queries into several parts to run simultaneously across multiple processors. Informix claims 10 to 30 times faster query processing via PDQ, yet some users said their current systems — including both OnLine 5.0 and 6.0 — are fast enough for them.

"I admire what Informix is doing with 7.0, but I bet there won't be much migration until next year or so," said Rick Creson, president of Parallel Technology Solutions, Inc., a database consulting firm in Portland, Ore., that specializes in Informix products.

Many users are just now making the transition from OnLine 5.0 to Version 6.0, so the latest database release "is pretty far off for a lot of people," Creson said.

Nevertheless, OnLine 7.0's debut means Informix has beaten rivals Oracle Corp. and Sybase, Inc. to market with a database significantly optimized for multipro-

cessing. PDQ in particular "vaults Informix past its primary competitors for high-end database processing functionality," said John Morrell, an analyst at International Data Corp. in Framingham, Mass. The architecture lets users take advantage of multiple CPUs, I/O channels and other simple features that work together to enhance multiprocessing performance, he said.

### Almost there

While a version of Oracle runs on massively parallel computers, the database requires application programmers and database administrators to write most of the code needed to spread processors. Sybase, meanwhile, likely will not ship the parallel product Navigation Server, which it is building with AT&T Global Information Solutions, until the summer.

But Informix's full parallel processing technology is not available: Tools for parallel administration and tuning are not due until 1995, and Informix won't support Unix clusters until then.

Oracle runs on clusters but does not provide the sophisticated backup and query partitioning functions in a parallel environment that Informix does, Morrell said.

For its development help, Sequent gets a six-month lead time during which it will be the only hardware provider supporting OnLine 7.0. After September, Data General Corp. is expected to jump in, along with other symmetrical multiprocessing (SMP) hardware makers.

Pricing for the product on Sequent's SMP Symmetry systems is \$1,125 per user for a runtime version and \$1,500 per user for development editions. Buyers must take a minimum five-user license.

Paralle	el visions
database maker has its owr	view of accomplishing parallel processing
DEVELOPMENT PARTNER	DESCRIPTION
Sequent	Core database rebuilt to allow symmetric parallel processing; massively parallel support planned for future.
None	Massively parallel features added into relational engine.
AT&T Global Informations Solutions	Add-on product dubbed Navigation Server designed for symmetric multiprocessing.
	DEVELOPMENT PARTNER  Sequent  None  AT&T Global Informations

David Eisenlohr
Computerworld Reader
Since 1981
VP, Telecommunications
The Pacific Stock Exchange



In the information market, this much is clear. Lendors make the products IS managers make the decisions.

Exchange went shopping for new intelligent hubs, they knew exactly what they wanted; drop-dead reliability, top-notch quality and true affordability. In precisely that order of importance. After all, the new hubs would be the central core of the entire trading system. In short, they may be high rollers, but they aren't willing to gamble.

Not surprisingly, they put their futures in Cabletron.
Not only were they a costeffective and high quality option, Cabletron's hubs offered the most important feature of all; rock-solid reliability. Is the Pacific Stock Exchange pleased with their hubs? Well, let's just say they wouldn't trade them for anything in the world.

And no one is better suited to bring them together than we are Another match made by Computerworld.



Bob Levine
Computerworld Advertiser
Since 1990
President & CEO
Cabletron Systems, Incorporated

COMPUTERWORLD

The Newspaper of IS



# CA client/server offerings turn heads

Anticipation builds as manufacturing packages near beta testing

Growing up slowly

The total worldwide manufacturing software market gives CA a large market to explore

By Thomas Hoffman

Computer Associates International, Inc.'s recently announced plans to introduce client/server versions of its CA-CAS manufacturing package — in addition to upcoming client/server extension modules for its IBM AS/400-based CA-PRMS manufacturing suite — have drawn favorable reactions from users at early test sites and prospective customers.

For example, CA-PRMS: Buyers Workbench, a client/server module designed to help manufacturers access planning data and evaluate suppliers, prices and contracts, has attracted the interest of Keeler Brass Co., a Grand Rapids, Mich., maker of decorative furniture hardware.

"The thing I like about the Buyers Workbench is that it does real-time client/server computations; it doesn't just download data from one system to another," noted David

W. Shirey, manager of systems and programming at the \$50 million manufacturer and a five-year user of CA-PRMS.

CA-PRMS: Buyers Workbench and four other client/server modules for the CA-PRMS package, are slated to enter beta testing by year's end and begin shipping by early 1995 for about \$18,000 each, according to John Capobianco, CA's director of business applications.

### **Worthy Workbench**

\$2.34B

\$2.67B\*

\$3.06B\*

Another forthcoming CA-PRMS module, Production Scheduling Workbench, is designed to provide quick-response shop-floor control for users to maintain accu-

rate, real-time manufacturing schedules.

Lawrence Louka, manager of operations planning at Ensign-Bickford Co., a Simsbury, Conn.-based maker of detonating systems, reacted favorably to his company's month-long testing of the module.

Louka said he hopes the client/server package will enable his firm to handle customer production schedules more quickly by using a Windows-based PC client extension.

"I can plan both materials and capacity at the same time now, which I couldn't do before. I think we should be able to improve our business through quicker planning with this," Louka noted.

Anxious CA manufacturing customers will be able to

put their arms around CA-CAS/Unix first because these products will enter beta this month and are expected to ship by September (see story below). Developed in two versions for commercial and aerospace/defense firms, CA-CAS/Unix is based on a three-tiered elient/server architecture.

Desktop versions of the package will be Windowsbased, while database and application server portions of the software have been designed to run on HP/UX, Hewlett-Packard Co.'s version of the Unix operating system.

### Limited appeal?

Analysts said the CA-CAS/Unix and CA-PRMS client/ server products are expected to satisfy the technical requirements of CA's manufacturing customers. However, the jury is still out on whether the new features will lure many first-time buyers because manufacturing industry users tend to remain loyal to their software vendors.

"CA-PRMS is good for their existing customer who is moving to client/server, but it won't be competitive in the marketplace until they come out with Oracle or Sybase versions," noted Clare Gillan, director of applications at International Data Corp. in Framingham, Mass.

Robert George, a senior industry analyst at Advanced Manufacturing Research, a Boston-based research firm, said CA will introduce Sybase, Inc. versions of CA-PRMS by year's end, followed by Oracle Corp. and Informix Software, Inc. versions by early 1995. Both CA-CAS/Unix and CA-PRMS now run on IBM's DB2 and CA's IDMS databases.

# **New Products**

Wall Data, Inc. has introduced Rumba for the AS/400 Version 2.0 and Rumba for the Mainframe Version 4.0 connectivity software.

According to the Redmond, Wash., company, the products' user interfaces include a Windows NT SNA Server Interface providing direct access to mainframes and IBM AS/400s; a selective install feature that offers users customizing options at the interface, display and overview level; configurable menus; a floating tool bar; and TrueType fonts.

A single-user license fee for Rumba for the AS/400 Version 2.0 and Rumba for the Mainframe Version 4.0 costs \$400.

►Wall Data (206) 883-4777

Generic Software, Inc. has introduced Release 5 of Save Output Queue for the IBMAS/400.

According to the Madison, Miss., company, the product is a spool file management system that lets users archive, retrieve, duplicate and delete spool files.

Enhancements include the ability to submit save requests to batch; on-line user interface manager help text for all Save Output Queue commands; and spool-file retrieval of files archived using Save Output Queue Release 3 or higher.

Save Output Queue Release 5 costs \$499.

► Generic Software (601) 853-1189

# Andersen Consulting joins Unix trend with Mac-Pac

By Ellis Booker

Earlier this month, Andersen Consulting joined the growing ranks of Unix true-believers among manufacturing software vendors by unveiling Mac-Pac Open, a

Unix implementation of its integrated manufacturing, distribution and financial system.

The Chicago firm is the latest manufacturing software vendor to offer a Unix version of its core product.

At a recent user group meeting, Avalon Software, Inc. in Tucson previewed the next release of its Computer Interactive Integrated Manufacturing system, a client/server software product that uses Unix databases from Oracle Corp. or Sybase, Inc.

In January, Cambar Software in Charleston, S.C., announced Control II, a client/server implementation of its Control integrated distribution software system for distributors and manufacturers.

The ASK Group, Inc., a vendor of VAX-based manufacturing systems in Mountain View, Calif., recently began selling a Unix-based product, and Computer Associates International, Inc. is reworking

its manufacturing line (see story above). Next month, System Software Associates, Inc. in Chicago will release a Unix version of its AS/400-based product.

"If you go down the list of vendors, virtually all have announced a Unix product

MAC-PAC OPEN
UNIX° Technical Architecture

MAC-PAC OPEN
Integrated, manufacturing, distribution and financial software salution

MACH II Execution Architecture

Choice of Dotoboses:
Sybose, Informix, Oracle

Choice of Hordware Platforms:
HP, IBM, Sun

\* With MAC-PAC'S MACH II Architecture, you can take advantage of multiple UNIX platforms, databases and configurations.

ANDERSEN
CONSULTING

Mac-Pac Open: Andersen's flagship gets a Unix twist

or direction," said Tony Friscia, president of Advanced Manufacturing Research, Inc. in Boston.

Friscia said that while the AS/400 midrange and IBM mainframe still predominate in manufacturing environments — Advanced Manufacturing Research numbers show close to 16,000 AS/400s and 7,000 mainframes running enterprise applications for manufacturers —

all future growth is in Unix sales.

"Actually, Unix by itself is incidental" to manufacturers, Friscia said. Rather, they have come to see the benefits of distributed, open architectures to coordinate enterprisewide activities and shrink product cycle times.

Andersen Consulting's Mac-Pac Open works with Unix hardware from Hewlett-Packard Co., IBM and Sun Microsystems, Inc. and Unix relational databases from Oracle, Informix Software, Inc. and

Sybase.

Mac-Pac, one of the first AS/400-based applications when it was introduced in 1988, has an installed base of about 1,000 sites worldwide, Andersen officials said.

Yet Andersen is not betting on moving most of these installed sites to Unix and will continue to sell its AS/400 product as part of the Mac-Pac Open line.

"Our customers seem to fall into two camps: those who are happy with the AS/400 and those who are oriented toward Unix," said product director James R. Brust.

According to Brust, manufacturers have been slow to adopt Unix

because of a lack of stable and fully functional applications. But this market will see 25% growth by the end of the decade, compared with 10% to 12% growth for AS/400-based systems, Brust said.

Mac-Pac Open will be available in the second quarter. The product, which is written in C and C++, is based on Andersen's own Maeh-II (Machine Independent Interface) execution architecture.



• Lawson Materials Management System

# HOW TO UNRAVEL THE CLIENT/SERVER MYSTIQUE.

irst, accept
that there is no
mystique. Rather,
there are hordes of
slightly frantic software companies content to have you believe that effective open
system solutions remain elusive while they
rush to understand, develop, and market
their interpretation of client/server.
Then there's Lawson Software.

# **An Open Systems Foundation**



to be a valuable business partner, an applications provider must offer choices for business strategy development. So for us, client/server isn't a new phenomenon. Instead, it's the next logical step in our development. And it exists today – fully developed and fully functional – in the latest release of our enterprise-wide, cross-industry, world-class business application software.

# A True Client/Server Solution

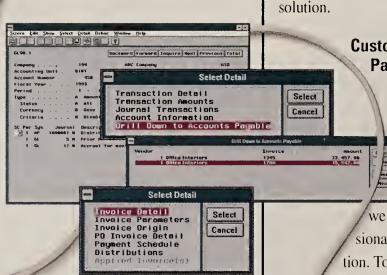
The truth is, client/server takes on a special meaning for each individual business computing environment. That's why we've structured our client/server solution as a comprehensive 3-tier architecture, delivering you maximum flexibility in hardware, database and user interface. It's why Lawson's products run across platforms like the AS/400 as well as UNIX systems such as the RS/6000 and HP9000. And it's also why we feature seamless support for a variety of leading databases. In short, we offer options that allow you to make the decisions. Based on your

existing hardware configurations and your plans for future development, you choose to place the components of client/server where they will deliver the greatest value and performance.

# Optimized Information Management

Lawson's efficient use of technology leads to a system with the scalability demanded in today's changing world.

We incorporate the latest GUI technologies, creating a user-friendly environment that reduces training time. Individual users can manipulate windows, icons and tool bars to create a personal work environment that increases productivity. In addition,

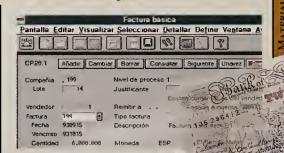


Lawson has revolutionized the way users access information with our comprehensive "drill-around" capability: now a single click of the mouse allows transparent access to data from multiple applications and platforms. And finally, to truly maximize your options, Lawson has maintained the ability to interface our applications using character-based terminals.

# **Worldwide Computing Flexibility**

Lawson's single, worldwide product set – featuring all the freedom of our flexible client/server architecture – means the ultimate in simplicity for large, international

MIGUR ALS MANAGEMENT SYSTEM • LAWSON HUMAN RESOURCES SYSTEM • LAWSON DISTRIBUTION MANAGEMENT SYSTEM • LAWSON ACCOUNTING SYSTEM



companies

functioning in a variety of intranational markets.

You'll find capabilities like support for multiple languages, currencies, tax codes and rates, as well as a variety of date and reporting formats. So whether your business is managing one site or sites around the globe, you can turn to Lawson Software for one total

# Customer-Focused Partnership

Lawson Software has always been focused on leading edge technology. And

we have always been passionate about client satisfaction. Together, these two commitments have resulted in truly flexible business solutions created with your needs in mind. We'd like the chance to demonstrate this to you. You'll see how – from our system architecture to

award winning client services – Lawson Software really docs unravel the client/server mystique.

For more information call 1-800-477-1357 ext. 844.



Running the World's Best Companies

Al product names referenced herein are trademarks of their respective companies.

# **Application Development**

# Vendor promises puzzle users

By Melinda-Carol Ballou

SANJOSE, CALIF

Vendor hyperbole is taking its toll on developers, who complain that vendors are adding eonfusion to already complicated

"Vendors go to great lengths to present the best possible pieture" for how their products will match selected technical problems, and these pietures are typically biased to reflect their product's strengths, said Thomas Davidson, viee president of eonsulting and services at Rippe & Kingston Systems, Inc., an aeeounting and software eonsulting firm in Cineinnati. The difficulty is that the teehnieal issues presented are entirely different depending on who you talk to, he

Davidson was among more than a dozen developers interviewed at the recent Software Development '94 show. Many said they are frustrated by vendor spiels.

### Fair comparison?

Some developers cited Microsoft Corp. as an example of a company that skews information. The eompany included in its marketing materials a document titled "Objeet Strategies: How They Com-

> pare," which listed vendors, their object teehnologies product features.

Not surprisingly, of 19 features listed as important, Miero-

soft's Object Linking and Embedding (OLE) includes 18 of them; the elosest eompetitor, by Microsoft's reekoning, was Next Computer, lne.'s NextStep, which offers 10 of the listed features.

IBM's Distributed System Object Model was credited with shipping only four of the 19 features, which IBM officials vociferously disputed when they saw the

For its part, IBM included in its marketing materials a

### Help with objects Corporate sites plan to implement a range of object technologies over the next two years, according to a survey of 291 developers conducted earlier this year\* **TECHNOLOGY** PERCENT C++6700 Class libraries 5900 Object-oriented analysis and design tools 51% Portable GUI builders 1100 4100 Object development environments Object-oriented frameworks 10% **Object-oriented DBMS** 3400 **Smalltalk** 28% Distributed object management facility

Source: Market Perspectives, Inc., Framingham, Mass.

\*MULTIPLE RESPONSES ALLOWED

eomparison of Component Integration Laboratories' OpenDoe and OLE. Microsoft is writing a rebuttal to that piece.

Despite the technical bickering, products announced at the show will make object-oriented programming easier, according to some developers (see story at left).

Nearly all the developers queried used their time at the show to hone their skills in object-oriented development.

"We're migrating a C base of eode to C++, and I'm here looking at advanced C++ and OLE. I'm trying to see how people use C++ in nonobvious, more eom-

Promises, page 62

23%

200

# Show highlights

roduet announcements from vendors at the Software Development '94 show included the following:

**▶Watcom International**, now a subsidiary of Powersoft Corp., announced a major version of Wateom C/C++ with a multiplatform graphieal user interface development envi-

►Neuron Data, Inc., a software developer in Palo Alto, Calif., announced a new version of its SmartElements rule and object applieation development environment that incorporates support for C++. This will allow C++ users to embed business logic and proeesses into their object-oriented applieations, eompany officials said.

► Mainsoft Corp. in Mountain View, Calif., signed a license agreement with Microsoft that will enable Mainsoft to incorporate source eode for eurrent and future Windows teehnology into its eross-development tools. This eombination of Windows source code with Mainsoft's MainWin kit offers a Windows application programming interface (API) for multiple computing environments.

It will allow Windows developers to provide their applications across Windows NT, Windows and Unix operating systems, aeeording to eompany officials.

► Woodland Hills, Calif.-based Sterling Software, Inc. released Answer: Zim 5.0, which lets developers create Windows applications that run in Windows, MS-DOS and Unix environments. It offers both graphical and text-based user interfaces.

-Melinda-Carol Ballou

# Commentary

Melissa Cook

# Get back to basics

How do you re-engineer the enterprise information arehiteeture when you never engineered it in the first place?

Face it, most eompanies really never engineered their systems architecture. It evolved. However, Darwin's theory of evolution may not apply here, and survival of the fittest does not seem to be working. A lot of exciting progress has been made, but many re-engineering development efforts have tiptoed around those legaey transaction processing systems that still run the eore functions of large businesses.

In many cases these legacy systems are dinosaurs struggling to handle new business situations, but they are so complex that attempts to replace them have failed more than they have sueeeeded. Someone had it right when he ealled our field of expertise data processing. We have spent billions of dollars throwing teehnology at incompatible and redundant data

Cook, page 63

# Start-up eases software integration

# Mapping old data to new systems now simplified

By Melinda-Carol Ballou

■ Start-up New Paradigm Software Corp. recently introduced its first middleware software product, which lets developers integrate software running on heterogeneous platforms without additional programming, company officials said.

Dubbed Copernieus, the New York company's product lets systems and software eommunieate via a translator, which interprets system transaetions and functions. As data enters the system, Copernieus' Universal Translator uses "methods" or "objects" chunks of eode stored in an internal database assigned to map to a specifie task — to link disparate applications, eompany officials said. As new functions are added, the translator updates the system without rewriting the software program.

Because Copernieus' translator handles the disparities and eommunications between one application and another, no additional programming is

required to link them, eompany officials said. Developers ean use this to integrate legacy applications and data with new software, they added.

### Pleased with performance

William Finley, president of Financial Performance Corp., is using Copernicus with Mars, his company's frontend profitability software that integrates data and services from different banking departments. He has already brought the software into pilot programs at three major banks and will add eight to 10 additional banks over the next few months, he said.

"You can tie all those different files together 10 times faster and 50 times cheaper using Copernicus [vs. traditional programming methods] because you can hook them together directly using [Copernicus'] methods," Finley said.

"Normally when you develop a custom interface or use [application programming interfaces], you have to have a debugging period and risk something going wrong. Using methods, you don't have to play around with the existing system; you can take an old system and hook it into the new without any problem," Finley

Another advantage of the Copernieus approach is reusability—the mapping objects are stored in the database so they are accessible for reuse, industry analysts said.

"It's a promising technology — mapping old data to new systems is always a major struggle, and they're providing a mechanism for doing that, which from the description is easy and straightforward," said Gonlde, an analyst at Patricia Seybold Group consulting firm in Boston.

"It's not that other companies haven't done mapping, but [Copernicus takes] a database-driven approach, which makes it easy to maintain, extend and reuse the mappings or methods" and incorporate business processes, Goulde said.

Copernicus is shipping now for the Unix 700 platform and Windows. It is priced between \$25,000 to \$100,000, depending on system configuration and number of users.

# Vendor promises puzzle users

CONTINUED FROM PAGE 61

plicated ways," said David Olsen, software developer and owner of Berry Hill Software, a small shop in Port Townshend, Wash., that specializes in transportation software.

M. W. Heyn is a developer and consultant working with museums in Los Angeles to help them define their require-

ments for creating virtual reality kiosks using object-oriented analysis techniques. "I'm here to check out C++ and other object-oriented languages," Heyn said.

Lack of ability to coordinate client/server data across traditional relational database management systems and workstations with a range of other devices, such as measurement instruments, proved frustrating to a developer from The Boeing Co.

"We create all these beautiful and expensive CAD drawings," said Scott Sandwith, specialist engineer of operations technology at Boeing's Commercial Airplane Group in Seattle. However, when personnel in the field need to apply information from other devices, such as measurements for plane parts, to the computer-aided design (CAD) design, they

are unable to incorporate that data, he said

Sandwith spoke for the majority of those queried at the show when he said the advantages of bringing in client/server and object-oriented technology are ultimately worth the challenges.

"It's the future, and we have no choice but to dig in and learn everything we can," even though it is not always easy or possible to access the required information, he said.

# Briefs

### New interface offered

AutoTester, Ine., a Dallas vendor of software testing products, announced the release of an interface between KnowledgeWare, Inc.'s Application Development Workbench (ADW) computer-aided software engineering (CASE) tools and AutoTester Plus, an automated software testing tool.

This interface extracts definitions from screen maps generated by ADW and converts them into AutoTester Plus format. AutoTester Plus then generates test scripts that drive the application and determine whether or not the defined business function performs as expected by the software. AutoTester also offers interfaces to Texas Instruments, Inc.'s Information Engineering Facility CASE tools.

# SunSoft ships tool set

SunSoft, Inc. announced it is shipping the Solaris Developer Solution Pak, a \$995 bundled development tool set for Solaris x86 applications that run on Intel Corp. microprocessor-based machines.

# **Acquisition completed**

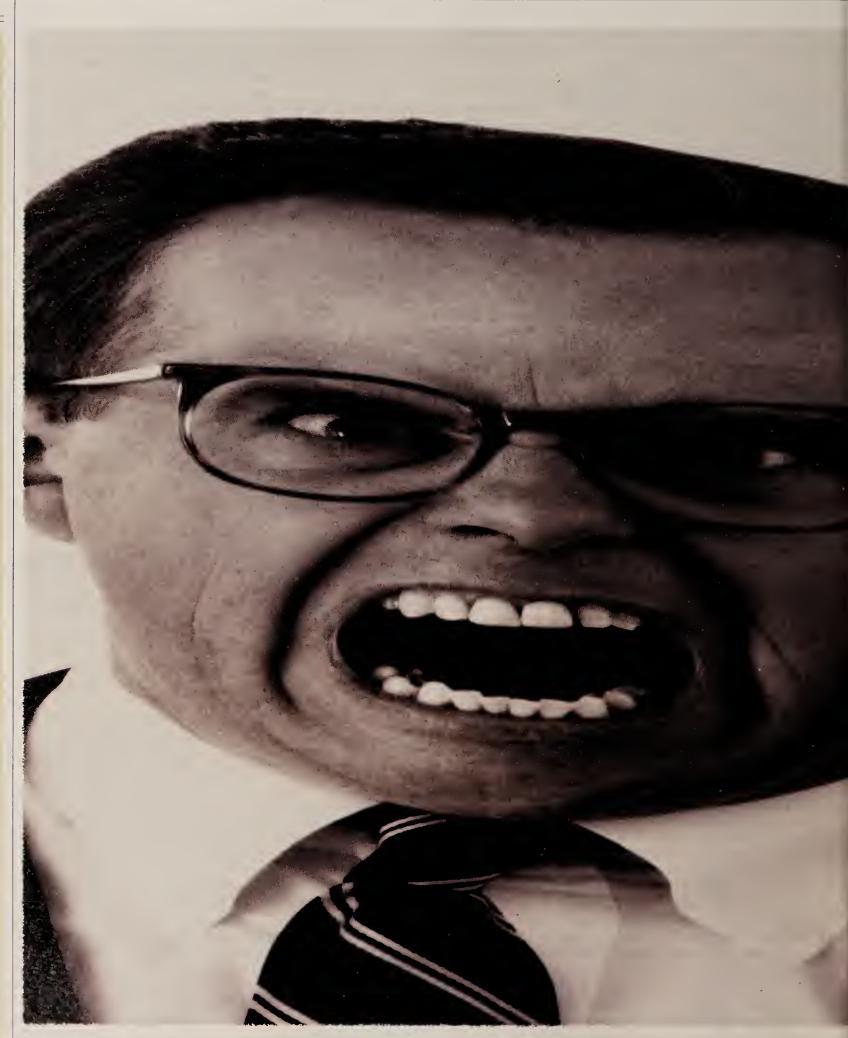
Productivity tools vendor International Software Group International, Inc. in Waltham, Mass., completed the aequisition of Cortex Corp., developer of CorVision, a repository-based client/scrver application development tool.

# **Investing in Premier One**

Premier One Consultants, Inc. in Minneapolis announced that a venture capital fund affiliated with Corlnthian Corp. in Chicago has invested in Premier One.

# Code converter offered

Four Seasons Software in Edison, N.J., announced a 4GL-to-C code converter as an add-on utility for its super Nova development suite. The company said the tool converts Super Nova fourth-generation below the (4GL) application code to the address more portable and my magusers more portable and my magusers more portable and my form. The converter costs \$5.00.



# **Application Development**

# Cook

CONTINUED FROM PAGE 61

and processes and created electronic labyrinths that even Super Mario would have trouble navigating.

How did we get into such a mess? If you look closely at a diagram of your system architecture, you are likely to see an embedded organization chart, each department with its own databases and applications. The problem is that the organization chart is inherently unstable, and many parts of the organization need similar data and perform similar processes.

We need to get back to basics. Your architecture should be component-oriented and built around data and processes and not the organization chart.

This approach also enables a clean transition to clients (processes) and servers (data) and can be implemented in any technology. Since data is inherently stable and processes are inherently unstable, start with the data. Many strategic redesign issues are also embedded in the data.

Databases should be designed around facts, not transactions. To design databases around facts, you must create a data model, a standard structure for all companies that the enterprise does business with, including suppliers, dealers and end users. They do not have to be in

the same database, but the data must be eompatible so you can identify companies that are suppliers and customers.

Can you link service contracts, orders, quotes, marketing inquires and warranty registrations for the same customer? If your business sponsors aren't asking for this data yet, wait until their competitors have it. Watch out for "never" statements like, "Our suppliers will never be our customers."

If you decouple your database structures from your processes and build them around a factual-based data model, it will allow new processes to be implemented more quickly.

### **Process-oriented**

Software should be designed for a process, not a department. Perhaps your company sells simple products and complex products. You probably have two different ordering processes and may need two applications, one for simple products and one for complex products. You don't need separate order applications for the telesales department and the direct sales department.

Your users may not be happy with this. Some departments may end up using two pieces of software where they had one, but they will have software peaked for each process rather than a mega application four releases behind the current requirements for the department.

IS departments that have systems aligned with departments may fight this also. But this approach will also buffer you from reorganization and let you easily replace these smaller pieces of software where a process improvement has been identified by the business.

Technology will continue to make it easier to integrate multiple applications or clients into a user environment. Draw a reasonably firm line around the processes that will be automated and resist the urge to tack on major new processes.

### Regular updates

Unlike data, processes are unstable and you want to quickly replace software with a better process or technology. For the first time, you will be able to complete an application's l'unctionality in one or two releases, let it do its job for a few years then replace the whole thing quickly with new technology or a new business definition of the process.

Separation of data and processes moves toward defining your architecture as a set of databases that can evolve to servers and processes that evolve into application clients. It lcts you take advantage of computing power where you need it, processing the transaction on the desktop or serving data to the trans action.

It's important to note that these engineering principles enable, but do not require, a move to client/server or objectoriented technology.

So dust off those data modeling and data dictionary training materials. Make sure you understand what processes you are automating, not which department.

Cook is the corporate marketing information architecture manager at Hewlett-Packard Co.

"I've spent a bazillion dollars building our information systems. am I not smiling?" So why



Now you can unlock the information trapped in your enterprise and deliver it to your users.

Introducing Huron—the first Distributed Business Information System

Ten thousand users can't get at the information they need, and you're the one they call. It's time to get Huron.®

Huron is a revolutionary software system that builds and distributes integrated information across corporate desktops, departments and divisions.

With a user interface, transaction manager, application development and maintenance environment in one, Huron turns incompatible databases and hardware into a single, enterprisewide information system.

Users gain a consolidated view of critical data. And prior system investments coexist peacefully with new technology.

Start satisfying the needs of the business and your IS community. Evaluate Huron now.

Call Amdahl today at 1-800-447-0044, ext. 202.

More Power In One



# Congratulations, Apple, on a day we've both looked forward to seeing.



IBM Microelectronics On March 14th Apple

Total Technology Solutions launched Power Macintosh™

systems, a family of personal computers using our revolutionary, RISC-based PowerPC™

microprocessors. As a member of the PowerPC alliance with Apple and Motorola, we're proud to see such tangible proof that our vision has

become a reality. Yet while IBM is delighted to celebrate today, we're still determined to anticipate tomorrow. With products, applications and support designed to make PowerPC microprocessors, and the systems they run, the future of computing. It's a challenge IBM Microelectronics™ Division and Apple welcome. In fact, we look forward to it.



# Management

# BY KEVIN BURDEN

IS managers at nonprofit organizations can fund their pet projects with government and private grants. But you have to know how to play the game.

David E. Garets has just started what promises to be a long and arduous journey.

As chief information officer at Magic Valley Regional Medical Center in Twin Falls, Idaho, Garets is heading a consortium of hospitals that is attempting to improve health care for southern Idaho and northern Nevada.

The Idaho Medical Information Consortium is developing a prototype rural hospital system. Its goal is to integrate the information systems of five area hospitals and approxi-

mately 200 independent physicians and to give them access to a common patient medical history database.

The estimated price tag of roughly \$4.5 million is clearly out of the reach of the consortium's IS budgets, so consortium members are looking for outside help from government

grants and private philanthropies.

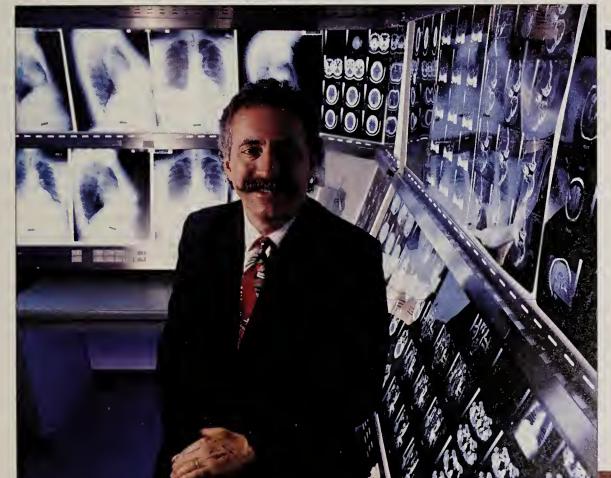
There are literally thousands of grant providers willing to throw money at projects that fit their funding guidelines, and a sizable slice of funds goes toward computer hardware and software.

However, providers are not on a mission to computerize nonprofit organizations. Because computers are now commonplace and technology becomes outdated so quickly, grant providers are reluctant to fund equipment, says Andrew Grant, director of grants at Baruch College in New York.

Grant givers are looking for bids that match their aims and criteria, and grant-winning IS organizations

Free money, page 66

Health care ClO David E. Garets
is applying for growns to fund
a rural health care specifical
Idaho and Nevalls



# Free money

CONTINUED FROM PAGE 65

know this. If you want to bring home the bacon, you have to do your homework to find the right philanthropies and agencies and then learn to speak their language.

ne of the hardest parts of any grant application pro-

# Doing your homework

cess is knowing where to turn for funding, experts say.

There are approximately 22,000 private grant foundations in the U.S., and while there are fewer federal agencies, their complex bureaucracies can make them appear just as numerous. Some of the differences be-

tween them are subtle; others are sub-

stantial. Applicants must be prepared to

adjust themselves accordingly.

Perhaps the most significant difference is that the funding interests of federal programs are dictated by legislative mandates. It's easy to see why many applicants get discouraged: The application forms are often the size of an epie novel and the institutions are heavily bu-

Private foundations are usually far more restrictive. Applicants are typically limited to a geographic region, and each foundation has its own notion of what eonstitutes a "politically correct"

reaucratic.

project worthy of funding.

The purpose of public foundations, like that of federal sources, is typically to advance a particular interest. But unlike their federal counterparts, these organizations' governing boards are not legally restrained from deviating from their main stage activity. For instance, many private organizations ignored their prime directives and contributed funds to the American Red Cross for disaster relief for the Los Angeles earthquake and the flood in the Midwest.

Eligibility requirements not only differ for each foundation, but they also differ within each foundation's various programs.

Cost-sharing percentages also vary, and some foundations deposit a lump sum into an account while others pay only in reimbursement installments.

### Making a match

o matter which path you choose, applying to providers whose funding priorities match your project is the best way to increase your chances.

Fully researching each grant maker to be sure it can satisfy your funding needs is just as important as targeting foundations whose records of giving closely relate to your project.

Applicants can follow all instructions of the funder, communicate their proposal in precise, clear language and have an impressive track record of project completion. But nothing will increase the

# This just in from the techno-grant front . . .

The National Telecommunications and Information Administration has announced a **\$26** million grant program to fund projects associated with the advancement and delivery of advanced telecommunications technologies. All nonprofit public and social services are candidates for funding.

The program is looking for projects designed to enhance the delivery of social services, promote access to government information and promote the advancement of an improved nationwide information infrastructure.

**Applications must be received by May 12, 1994.** Recipients will be required to provide 50% of the total project cost. Joint applications from partnerships will be looked on favorably.

**For more information**, contact Charles M. Rush, acting director at the Office of Telecommunications and Information Applications, 14th St. and Constitution Ave., NW, Room H-4889, Washington, D.C. 20230, (202) 482-2048.

Program details can also be accessed via the Internet. FTP to: ftp.ntia.doc.gov. Log on as anonymous; use your E-mail address or guest as the password. The file name is niiagenda.asc.

ehances of success if you apply to the wrong sources.

"There are many worthwhile projects that must be declined because so many organizations are pursuing limited dollars," Grant explains. "Poorly written proposals simply make it easier for funders to reject the request."

Finding the right provider involves a lot of painstaking but necessary research. However, applying to grant givers whose interests don't match your own will only waste time and money. Although there is never an application fee to submit a grant proposal, the time wasted on proposal preparation makes it a money-losing proposition.

If you've done all of the above and are still turned down, don't be discouraged. Find out why the proposal was not considered and make changes accordingly. Chances are that your proposal may meet with success somewhere else or even with the same foundation the next year. And it may be that your proposal was strong, but someone else's — such as the grant winners on page 70 — was just better.

# American Association of Fund-Raising

25 W. 43 St., Suite 820
New York, N.Y. 10036
(212) 354-5799
A trade association of for-profit fund-raising consulting firms. Tracks national philanthropy totals from private, federal, corporate and personal sources. Will supply a membership directory to those looking to employ a fund-raising group.

# **Public Management Institute**

358 Brannan St.
San Francisco, Calif. 94107
(415) 896-1900
Publishes resource directories:
Corporate 500: The Directory of
Corporate Philanthropy, The
Computer Resource Guide; and
Capitol Campaign Resource Guide.
Also maintains an on-line database
of corporations that provide grants.

Catalog of Federal Domestic
Assistance — Published by the
U.S. Department of Commerce
(202) 512-0000
A guide to the 13,000 grant
L ograms administered through 51
Foducal agencies. For more
with an on grant providers in
vot 1, 10, 75 e area, contact your
public do 1).

# Finding funds

Sources that can speed up the search for grant programs

### **The Foundation Center**

79 Fifth Ave., 8th Floor New York, N.Y. 10003 (212) 620-4230

312 Sutter St., Suite 312 San Francisco, Calif. 94108 (415) 397-0902

1001 Connecticut Ave. N.W. Washington, D.C. 20036 (202) 331-1400

1422 Euclid, Suite 1356
Cleveland, Ohio 44115
(216) 861-1934
A national nonprofit organization that collects and disseminates information on private foundations and corporate philanthropy. The center offers free public access to four libraries, publishes a variety of directories and grant-seeking technique guides, offers educational seminars and maintains a nationwide network of 190 cooperating organizations equipped with the foundation's reference directories.

# Research Grant Guides, Inc.

12798 W. Forest Hill Blvd., Suite 304 West Palm Beach, Fla. 33414 (407) 795-6129 Publishes directories containing profiles of private and federal grant-making institutions. Directory titles include Computer and High Technology Grants; Building and Equipment Grants; Grants for Organizations Serving People with Disabilities; and Operating Grants.

# Capitol Publications, Inc.

1101 King St., Suite 444
Alexandria, Va. 22314
(703) 683-4100
Publications include Federal Grants
& Contracts Weekly, Education
Grants; Education Grants Alert; and
Foundation and Corporate Grants
Alert.

# The Taft Group

835 Penobscot Building
Detroit, Mich. 48226
(800) 877-8238
Publishes a variety of directories
that include Federal Support for
Nonprofits; Corporate and
Foundation Grants; Corporate Giving
Directory; and The Nonprofit
Computer Sourcebook.

### The Detroit area libraries

ne grant-winning organization that knows how to prepare applications and eheek out funding sources is the Detroit Public Library, which sought grants to become automated.

The library received the bulk of its \$4.7 million in project costs from a variety of private foundations as well as from federal funds from the U.S. Department of Education.

The Detroit Area Library Network automation project is networking the city's main library with 25 braneh libraries. The system uses an existing mainframe at the host library at Wayne State University.

However, the library needed help financing the terminals, teleeom equipment, printers, bar-code scanners and cabling, according to Helen Ma, automation coordinator.

"The budget that paid for all the automation equipment, every single dollar, came from special funding and grants. Not one single dollar came from our operating budget," Ma says.

When the decision was made in 1988 to pursue the automation project, research and grants ecordinator James W. Lawrence immediately began identifying potential funding sources. Knowing the project was too large to be funded by a single sponsor, the library applied to

Free money, page 70

# PeopleSoft began shipping client/server applications before most people knew client/server existed.

1989	1991		1993
PeopleSoft HRMS 1 ships	PeopleSoft HRMS 2 ships		PeopleSoft HRMS 3 ships
		1992	1993
		PeopleSoft Financials 1 ships	PeopleSoft Financials 2 ships

It's a track record that's hard to beat — especially when you consider that most application vendors are still new to client/server. They're still making promises, announcing plans or experimenting with client/server technology. They're simply not prepared to support you in a client/server production environment.

PeopleSoft began shipping client/server business applications in 1989. And as client/server technology has evolved, we've responded with new releases and functionality. Today, companies worldwide are benefiting from our six years of client/server experience.

What's more, only PeopleSoft applications give you a choice of six RDBMS platforms. So you can use the same applications whether you're upsizing to a mainframe, downsizing to a LAN, or rightsizing to anything in between. You'll find that PeopleSoft delivers the power and innovation of applications developed specifically for client/server, plus the ease of use that comes from our familiar Windows interface.

That's why PeopleSoft client/server financial and human resource applications are the choice of 322 companies, worldwide. (As of January 1994.) With more

signing up every day. Get the facts from our new white paper: Client/Server Business Solutions. For your free copy, and a schedule of our client/server seminars, please call 800/947-7753.



Run with it.



The Digital Corporation and Storage Works are trademarks of Digital Equipment Corporation.

Note: A Storage Line 2 and and SPARC station is a trademark of SUN Microsystems Inc.

# **Imagine Configuring Your Sun** Storage System In Less Time Than It Takes To Get A Cup Of Coffee.

What could be faster or easier than getting

Without tools or service calls either.

a cup of coffee? How about configuring your Imagine having that kind of control,

Sun® SPARCstation™ or SPARCCenter Server™ no matter what your needs are

with Digital's StorageWorks<sup>™</sup> SCSI-2 Deskside

Expansion

Pedestal for Sun.

Now, what used to

be an awkward,

time-consuming

task can be done

Sto	orageWorks Outshines	Sun
Add a device:	StorageWorks  Snap-in capability for choice of SCSI-2 Disk, Optical and Tape devices: 3.5" disk drives, 5.25" solid state disk drives, CD ROM and 4mm and	Sun Limited media. May require new subsystem.
Dual power supply:	8mm tape drives. Yes	No
Redundant cooling:	Yes	No
Easy component swap:	No powering down.	Must power down.
	And at just \$5,049 for 4.2GB this product is priced thousands less than Sun.	
S	torage W	TM .

And it's something you just can't get anywhere else.

For information on Digital's family of StorageWorks products for SUN that range from desktop to data

StorageWorks is designed – exceptionally modular, flexible and expandable. It gives you a wide variety of devices for a customized solution, and it lets you change components by simply snapping in devices, fans and power supplies without ever having to power down the system

quickly and easily. That's because of the way

center, including RAID, just call us at 1-800-DIGITAL. To

become a StorageWorks Reseller, call 1-800-STORWORK. What we suggest is that you do it on your next coffee break.



o Work

digital

# Free money

CONTINUED FROM PAGE 66

more than 55 foundations and the philanthropic arm of 45 corporations.

"We had our best luck with foundations right in the Detroit area," Lawrence says. "Many [foundations] we applied to outside Detroit said their funds had previously been committed."

### **Knowing what to address**

y knowing ahead of time what criteria would be used in judging its grant applications, the library was able to address those points up front in the various proposals. The main criteria includ-

ed the following:

 Cooperative partnering: The Detroit Public Library worked closely with the libraries at Wayne State University, the nual reports, the library was able to convince funders that its operating budget could handle anylong-term maintenance costs

### The MedConnect project

he library at the National Jewish Center for Immunology and Respiratory Medicine in Denver also applied for a technology grant to automate its library system.

Because its project was much smaller in scope than the Detroit Public Library project, the National Jewish Center was able to obtain the \$220,000 it needed from a single federal source, the National Library of Medicine, a department of the National Institutes of Health.

The consortium, headed by the National Jewish Center library, is connecting seven medical libraries to the Colorado Alliance of Research Libraries, an automated integrated library system. The grant, which was awarded over a two-year period, will pay for all the terminals, connection equipment and the process by which the books are cataloged — essentially everything but personnel and building renovations.

Again, the key to success was a strong proposal with help from the federal agency targeted for the grant. The National Library of Medicine assigned a grant administrator to work with the center and help with its proposal.

Rosalind Dudden, the health science librarian and principal investigator for the MedConnect project, said the assigned administrator proofread and commented on several drafts before completing the final 113-page proposal.

"She also had sent us copies of three successful grant proposals which were similar in scope to our project," Dudden says.

The MedConnect proposal was approved for funding five months after it was first submitted. It took another seven months before the money actually became available.

s with the Detroit Public Library, the National Jewish Center did its homework on what criteria would be used to judge its application and addressed the same basic guidelines:

- Cooperative partnering: The National Jewish Center brought together seven health science libraries in Colorado that jointly applied for the grant and will work together to connect to the Colorado Alliance of Research Libraries system.
- Project commitment: The National Library of Medicine required that project group members prove their commitment by sharing the cost of the project. The consortium contributed \$446,000, which went toward the cost of personnel, office renovations to accommodate new equipment and the cost of cataloging books.
- Benefit to the community or a show of community support: Because each participating library has concentrated resources on a particular medical speci-

# Detroit Public Library The information place.

**Project:** Automate and network main library and 25 branch libraries.

Year project and fund-raising began:

**Status:** All necessary funding has been received. The final two branch libraries will be connected by June.

**Applied to:** 55 foundations and 45 corporations.

# NUMBER OF GRANTS AND AWARDS RECEIVED

\$500,000 — \$1 million	2
\$100.000 \$499,000	5
\$25,000 — \$99.000	5
\$6,000 \$24,999	9
\$1,000 — \$5,999	14

Total of all grants and awards: \$4.5 million

**Matching funds:** The Detroit Public Library contributed \$266,000 toward personnel, space allocation, wiring, administrative costs and security measures.

# MedConnect Medical Library Connection

Library project for the National Jewish Center for immunology and respiration medicine in Denver.

**Project:** Automate and connect seven medical libraries to the Colorado Alliance of Research Libraries network.

**Status:** Received grant and completed first year of project in January. Full project will be completed by the end of the year.

**Grant:** One federal grant totaling \$220,000 over two years from the National Library of Medicine.

# GRANT TIMETABLE

Proposal submitted:

Approved for funding:

Notified of funding:

Funds available for use:

Oct. 1991

July 1992

Nov. 1992

Feb. 1993

**Matching funds:** MedConnect contributed \$466,000 toward personnel and building space.

# Magic Valley Regional Medical Center



**Project:** Develop a regional health care network by networking five hospitals, approximately 200 physicians and other public health facilities in southern Idaho and northern Nevada.

Estimated cost of project:

+.J IIIIIIOII. I-k-hima famalas Cu

**Matching funds:** Expect to raise roughly half the total project cost.

# Master of the grants game



"You really need to prove to the foundations that you have the ability to complete what you start."

# James W. Lawrence

Research and grants coordinator Detroit Public Library

Education: Bachelor's in sociology, Grand Valley State University, Grand Rapids, Mich.; master's in library sciences, Emory University, Atlanta; MBA in finance, Wayne State University,

**Grant training:** Workshops from the Grantsmanship Center in Los Angeles and the Council of Michigan Foundation in Detroit.

**Track record:** Began grant writing career in April 1987.

Number of proposals submit	
Number of grants received:	80
Success rate: 88%	
Average number of proposal written per year:	ls 10

### **Making it personal**

ibrary Director Jean Curtis presented the project plans in person to several of the more promising agencies to increase the proposal's visibility. She was able to learn what each agency considered an el-

igible project so that the library could customize its proposal—a key step.

For example, the Skillman Foundation in Detroit, which awarded Detroit's library automation project\$1 million, concentrates many of its grants in the areas of education and child welfare. Not surprisingly, the project's objective statement in its Skillman proposal stressed the benefit to the area schools.

"Because the schools depend a lot on the public library and this system would allow schools to connect remotely, we were able to make a good argument on how the system would benefit education," Lawrence says.

An important detail in applying for this grant was naming not the library itself but its nonprofit fund-raising wing. The Friends of the Detroit Public Library, as the grant recipient. Even though the library is nonprofit, it is ineligible for assistance from many foundations simply because it is a branch of city government.

University of Detroit Mercy and Oakland University at Rochester Hill, Mich., which were also looking for automation grants. Although each library applied for grants separately, they played an active part in one another's proposals, stressing how the libraries would eventually be networked to share resources.

- Benefit to the community or a show of community support: The library received \$12,000 from public donations. Patrons were able to contribute to the program through drop-off boxes at the branches and by way of brochures with tear-off mail-ins. Corporations lining up for sponsorship included Detroit heavy-weights such as the Chrysler Corp. Fund, Ford Motor Co. Fund, Detroit Edison Foundation, Comerica Bank and ANR Pipeline Co. Together they donated a total of \$111,000 to the project.
- Grant track record: As an old institution, the library was able to document a long history of grant-sponsored projects. And because funders like to see with whom they will be keeping company, the library kept all foundations that had not yet reached a decision abreast of the awards that were already received.
- \* Life after funding: The proposal assured contributors that the funding was for a onetime start-up cost. Through an-

ality, the Colorado libraries system stands to broaden its medical resources.

- Grant track record: The participating libraries had not only a list of past grant projects but also a history of past coopcrative projects.
- · Life after funding: The top administrators at each of the seven health science libraries attached letters to the proposal expressing their commitment to the project and guaranteeing to include the annual \$10,000 cost of using the system in the hospital operating budgets.

The libraries are eurrently in their second year of funding and will complete the project by year's end.

### Final advice

ere are a few final points to keep in mind while writing your proposal. Be realistic and don't promise what can't be delivered. Be very specifie communicate exactly

what your project is and precisely what you need. Show wide benefit for your grant proposal. Submit a detailed budget and be able to substantiate all the figures leave the guesswork out. Do not enease the proposal in plastic or in a binder, the funders will need to make copies, make it easy for them. And use layman's language -- do not fill the proposal with abbreviations and acronyms. After all - foundations certainly won't fund what they can't understand.

Foundation financing Grants from private foundations paid for nearly half the Detroit Public Library automation project		
Foundation grants	49%	
Funds from the city of Detroit	31%	
Matching funds from the Detroit Public Library	6%	
Bequests to library	5%	
Federal grants	3%	
Corporate gifts	3%	
Public contributions	1%	
Interest earned on funds	2%	
Total funds: <b>\$4,763,36</b>	3	

# Tom Peters to ClOs: Weird is good

By Allan E. Alter

hief information officers ought to collect weirdos. They should replace today's "monstrous organizations" with radically decentralized "curious corporations." And they should accept that having no job security is the 'price of having a lot of fun."

"Who wants to be a footnote in the [information technology] revolution? Better to go screaming down in

If that sounds like a recipe for going crazy, that's exactly what management guru Tom Peters intended.

"Crazy times call for crazy organizations," he recently told IS executives at an Orlando, Fla., conference held by CIO magazine. Peters is author of In Pursuit of Excellence, Thriving on Chaos and most recently, Liberation Management.

### Make cuts, encourage weirdness

Peters said companies must first drastically cut their headquarters staff, then foster imagination, euriosity, initiative and weirdness. These radical actions are needed if eompanics are to thrive in the most rapidly changing era since the dawn of the Industrial Revolution.

Even popular management concepts such as re-engineering and focusing on core competencies can trap companies.

Re-engineering is "fundamentally flawed" because it assumes there is one best way to do things. Streamlining processes is important but it does not address a more basic issue: What business is a company really in?

And as technology and customers change, "yesterday's core competence becomes today's millstone," he said.

AMR chairman Bob Crandall is an IS hero for building American Airlines' SABRE reservation system. But "where did Crandall's eorc competence and dynamic process model lead to? He built a great system and destroyed the airline

"Who's the hero now? The weenie from Southwest Airlines who won't even give you peanuts," Peters said.

Peters did not lay out the implications of his radical ideas for corporate IS infrastructures, but stressed the importance of information technology. "The technology is where the answer is," he said after his speech.

"There is nothing more stupid than narrow-minded discussion of [information technology] benefits. You spend a



Tom Peters: Who wants to be a footnote in the finformation technology] revolution? Better to go screaming down in

million dollars on [information technology] and can't figure out the benefits? Welcome to life!" Peters said. "What were the productivity benefits of railroads for the first 50 years? Zero." It took half a century for companies to learn how to benefit from the transport revolution. The same thing is true for IS, he said.

"I ean't imagine outsourcing IS," Peters added. "The idea of shucking this off" to outsiders as if running the IS function were like running the company cafeteria "is a crock."

Nevertheless, the impossibility of matching technology to changing business needs has placed CIOs in a no-win situa-

You may be a hero for a while if you can get technology to work, but your best work will be bypassed as the world changes and makes your systems obsolete, he said.

"While you shampoo the carpet for the 23rd time, the competition will pull the rug out from you," Peters said.

But if you try something radically new and it doesn't work, you are history.

"It's obvious ClOs are an endangered species. There is no possibility whatsoever of a right answer. None," he said.

Listeners applauded enthusiastically — particularly after Peters' comments on outsourcing.

"We are all looking for ways to stop barriers to creativity," said Daniel Farley, a vice president responsible for IS at the New York State Electric and Gas Corp. in Ithaca, N.Y.

But one attendee told Peters after the speech, "I'll sit on it for 72 hours and think about it before I apply anything."

# Putting their best foot forward

Experts say philanthropists look for certain key elements in every application. These elements are present in the bid by David E. Garets, chief information officer at Magic Valley Regional Medical Center in Twin Falls, Idaho, and officials from other hospitals in their efforts to build a rural health care system for southern Idaho and northern Nevada.

# **An attention-getting project:**

Grant providers look for projects that will not only maximize the use of the grant but will also get them noticed. They want their funds to be the instrument of social change. This is especially true of private foundations. While there may be similar health care systems currently in place, none are as large as the planned Idaho project.

**Cooperative partnering:** Funders are more likely to finance projects that involve several organizations working together rather than a single company moving on its own. The once loosely connected group of hospitals and physicians are cooperating and are committed to this information integration project to improve the delivery of health care to the community.

**Project commitment:** Funders are looking for applicants to prove their commitment to the project, usually in the form of matching funds. All of the hospitals and participating independent physicians will be sharing in system costs by putting up money from their own budgets. The consortium expects to foot at least half the bill.

# Benefit to the community or a show of community support:

Projects supported by the community that they intend to benefit get noticed. The Idaho Medical Information Consortium, a group formed out of a statewide meeting sponsored by the governor of Idaho and the state legislators, officially designated its rural health care system as the test bed in Idaho for a computerized patient record system.

**Grant track record:** Grant providers are more comfortable funding organizations that can document successful grant projects. None of the participating hospitals have ever sought or received a grant this large, but they can document several successful small grant projects.

Life after funding: Funders need and sometimes require - assurance that the project will remain in force once the grant money runs out. The support of the Idaho state government works strongly in favor of the project.

# Here's a novel idea. IT actually making money.

Sounds crazy, huh? Well it isn't. If you've been trying to figure out how to squeeze better returns from your IT investment, you should call ROLM.

We can help protect your investment because

our phone systems work within

your existing LAN, PC, or mainframe environment. We



ROLM is part of the Siemens family, the world's largest private communication systems manufacturer. We have the technology to help your business work more efficiently can also help your business run a lot more efficiently. Adding thousands to your bottom line.

The FT department for Collin County. Texas couldn't agree more. With just a handful of staff members, they had to service a county that was

growing fast. Rather than subject this influx of callers to busy signals and long hold-times, their IT department

chose to install
a ROLM phone
system. Now they
can easily handle

the increase in incoming calls and transmit data through those same lines.

The result: an improved data transmission system that will save them \$50,000 annually, not to mention an additional \$60,000 on their annual phone bill. And they estimate they'll save two million dollars over the next ten years when they take into account the increased volume of calls.

If you'd like to help your company reduce costs, increase revenues or improve customer service, call the phone number below. We'll be glad to send you our free booklet entitled "101 Ways To Make Or Save Money With Your Phone System." And, of course, it's a free call.

See. we're already saving you money.



#### APRIL 3-9

EDI 2000. Chicago, April 5-6 — Keynotes: Jack Shaw, president, EDI Strategies, Inc., and Don Fuqua, president, Aerospace Industries Association. Contact: EDI 2000, Dallas, Texas (214)

Rocky Mountain Telecommunications Exposition. Denver, April 5-6 — Theme: "Where Communications and Opportunity Meet." Contact: Sheri Prom, Tele-Communications Association, Denver, Colo. (303) 860-6125.

The Annual Computer Storage Exposition & Conference. San Francisco, April 5-7 — Focus: The integration of the mobile office into networked systems and associated issues and products that deal with hierarchical storage management, system archiving and backup. Contact: Sandi Eberhard, Eberhard & Co., New York, N.Y. (212) 486-6186.

The Virtual Reality Forum 1994. New York, April 5-7 — Contact: Virtual Reality Systems, New York, N.Y. (212) 861-0588.

15th Annual Conference on IS Performance/ Capacity Management. Phoenix, April 5-8 — Theme: "Economies of the New IS Environment," including topics such as the new economics, financial management, sizing strategies and issues, controlling IS costs, performance/capacity issues and benchmarketing. Contact: The Institute for Computer Capacity Management, Phoenix, Ariz. (602) 997-7374.

Midwest Graphics '94. Detroit, April 7-9 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

# **APRIL 10-16**

Association of Banyan Users International, Inc. (ABUI) Spring '94 Conference & Exposition. Atlanta, April 10 — Keynotes: "Building and Integrating Applications Using a Messaging Infrastructure" by David Whitten, Office of Information Systems, Gartner Group, Inc.; "Reflections on the Future of Enterprise Networking and Messaging" by David C. Mahoney, CEO, chairman of the board, Banyan Systems, Inc. Contact: ABUI headquarters, Chicago, Ill. (312) 644-6610,

1994 KnowledgeWare International User Conference. Atlanta, April 10-13 — Contact: KnowledgeWare, Inc., Atlanta, Ga. (404) 231-8575.

Crossroads '94. Rancho Mirage, Calif., April 10-13 — Focus: Interpersonal networking for scnior executives - users and vendors - involved in open client/server computing. Contact: Open Systems Advisors, Boston, Mass. (617) 859-0859.

NetWare User Conference. Providence, R.I., April 11-12 — Contact: Providence NetWare User Conference, Orem, Utah (800) 755-9898.

1994 National Association of State Information Resource Executives Midyear Summit. Boston, April 11-13 — Contact: NASIRE, (606) 231-1905.

Managing Customer Service. Phoenix, April 11-13 — Focus: What is involved in supporting management procedures, work load descriptions and service-level contracts. Contact: The Insti-

# Calendar

# Computer Museum hosts Internet auction

n a high-tech twist on the charity auction, The Computer Museum in Boston will host "The First Internet Auction" April 22-29 to supportits educational programs.

The auction, the first of its kind, will be conducted entirely through electronic mail on the Internet.

More than 60 items will be on the auction block, ranging from Cardiac, a cardboard computer developed at Bell Labs (bidding begins at \$5), to an Ethernet Sniffer network analyzer from Smart Valley's Harry Saal and Network General Corp. (bids start at \$3,000). Many of the items up for bid are vintage components or documents of technologies from which the Internet has evolved.

Among the entertainment items up for bid will be the opportunity to spend an evening playing Space Wars,

the "mother" of all computer games. And Microsoft Corp. Chairman Bill Gates will provide the entertainment selection he would want with him if he were stranded on a descrt islandwith electricity. (No one will say what that is in advance.)

The auction is open to anyone who sends E-mail to auction-info@auction.tcm.org.Acomputer server will function as the "auctioneer," and anyone who submits a bid becomes a participant.

Those who want to bid without the benefit of E-mail can call (617) 426-2800, ext. 322.

Bidding begins at 10 a.m. EST. The auction continues round-the-clock until the last items close on April 29 at 8 p.m. For more information, call (415) 323-1909, or send E-mail to auctioninfo@auction.tem.org.

tute for Computer Capacity Management, Inc., Phoenix, Ariz. (602) 997-7374.

IPC '94 Conference & Exposition. Detroit, April 11-14 — Theme: "People, Partnerships and Technology." Contact: The Engineering Society, Ann Arbor, Mich. (313) 995-4440.

The Sixth Annual National Managed Health Care **Congress.** Washington, April 11-14 — Theme: "Realizing the Promise of Managed Care: Using Reform to Revitalize." Contact: The National Managed Health Care Congress, Waltham, Mass. (617) 487-6700.

Marketing the IS Organization Internally. Philadelphia, April 12 — Contact: Ouelette & Associates, Bedford, N.H. (603) 623-7373.

Global Environmental Excellence Conference. New York, April 12-13 — Focus: Senior executives seeking pragmatic ways to deal with tough environmental, health and safety issues. Keynote: Robert H. Campbell, chairman and CEO of Sun Co. Contact; Carol Courter, The Conference Board, New York, N.Y. (212) 759-0900.

1994 International Conference & Exhibition on Multichip Modules. Denver, April 13-15 — Sponsors: The Microelectronics Society, The International Electronic Packaging Society, The Electronic Industries Association and Components, Packaging, Manufacturing Technology Society. Contact: International Conference & Exhibition on Multichip Modules, Reston, Va. (703) 758-

International Multimedia Conference. Salt Lake City, April 13-15 — Contact: Steve Cantwell, Allen Communications, Inc., Salt Lake City, Utah (801) 537-7800.

International Wireless Communications Expo. Las Vegas, April 13-15 — Focus: Cellular, paging, specialized mobile radio. Contact: Communications Magazine, Englewood, Colo. (303) 220-0600.

InterGrowth 1994. Scottsdale, Ariz., April 13-16 — Focus: "Acquisitions and Divestitures — Delivering Corporate Growth and Renewal." Contact: Carl Wangman, Association for Corporate Growth, Glenville, Ill. (708) 699-1331.

Industry Futures Conference. Boston, April 14-15 — Focus: Gartner Group, Inc. analysts will present their views regarding the changing information technology landscape through the year 2000. They will explore communications, software and processes, with heavy emphasis on the future plans and potential survival of today's information technology vendors. Contaet: Gartner Group, Stamford, Conn. (203) 964-0096.

# **APRIL 17-23**

SHARE Spring 1994 Meeting. St. Louis, April 17-20 — Contact: SHARE, Chicago, Ill. (312) 822-

Accounting and Cost Allocation for Client/Server Systems. Toronto, April 18-20 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Distributed Computing World. Washington, April 18-21 — Focus: There will be four separate conferences designed for companies in the process of implementing distributed systems. Contact: Digital Consulting, Inc., Andover, Mass. (508)

Electronic Messaging '94. Anaheim, Calif., April 18-21 — Focus: E-mail. Contact: Electronic Mail Association, Alexandria, Va. (703) 524-5550.

ISCA '94: 21st International Symposium on Computer Architecture. Chicago, April 18-21 — Contact: Association for Computing Machinery, New

York, N.Y. (212) 869-7440.

Unix Reseller Conference, Dallas, April 18-21 ---Keynotes: Charles B. Wang, CEO of Computer Associates International, Inc. and Phillip E. White, CEO of Informix Software, Inc. Contact: Expoconsul International, Inc., Princeton, N.J. (609) 987-9400.

Distribution/Computer Expo '94 & Seminar '94. Rosemont, Ill., April 19-20 — Focus: Electronic data interchange, warehousing, transportation management, logistics, bar-code technology, distribution and industry trends. Contact: C. S. Report, Uwchland, Pa. (610) 458-6410.

Client/Server Developers' Conference. Washington, April 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Networks Expo. San Francisco. April 19-21 — Focus: Networking and computing. Contact: Annie Scully, Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Re-engineering: The Implementation Perspective. Boston, April 19-21 — A seminar providing an introduction to the concepts and objectives of re-engineering with an analysis of the business factors driving it. Instructor: Michael Hammer of The Center for Re-engineering Leadership. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

The Third International Conference on Software Methods. Boston, April 19-21 — Theme: Keeping methods turned to technology. In addition to keynote talks, the conference features numerous two-track sessions including: Software Development with Agents, Effective Technology Transfer, Reusing Products of Analysis, Client/Server Rapid Application Development and Methods for More Usable Software. Sponsors: Technology Transfer Institute and The Atlantic Systems Guild. Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

1994 Society for Information Management (SIM) Institutional Member Conference. Ponte Verdra, Fla., April 19-22 — Contact: SlM, Chicago, Ill. (312) 644-6610.

**Seventh Annual Intermac Users Group Education** Symposium. Toronto, April 20 — Focus: The three-day event will help users understand the world of bar-eode data collection and how to apply practical solutions that will help improve productivity and reduce operating costs in any business. Contact: Kimberly Lombard, Intermac Corp., Everett, Wash. (206) 348-2600.

The First Internet Auction, Boston, April 22-29 — Contact: The Computer Museum, Boston, Mass. (617) 426-2800, ext. 341/329.

CHI [Computer Human Interaction] '94: ACM Conference, Boston, April 24-28 — Focus: "Human Factors in Computer Systems." Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

VIP '94. San Antonio, April 24-28 — Legent Corp.'s annual users' conference. Open to all users of Legent products; designed for managers and professionals at all levels. Contact, Legent Corp., Herndon, Va (703) 708-3000.

# Sound productivity:



# Solutions that work in harmony.

Integrating your information systems—and increasing productivity—isn't as easy as it sounds. Especially when individual departments use their own individual solutions. That's why it's time you heard about SAP's fully integrated software solutions.

Designed for both client/server and mainframe environments, SAP's R/3 and R/2 Systems bring all your key players together—finance, manufacturing, sales, even human resources. So when business-critical information in one department or location changes, other departments can be updated automatically. Without skipping a beat. That means synchronizing critical manufacturing changes with your cost control staff. Keeping customers attuned to exact delivery dates. And making sure the information to make all decisions quickly and intelligently is right at hand.

Want to find out more? Call SAP and hear how organizations are already using our integrated software solutions to improve their productivity. And that's music to anyone's ears. Just phone 1–800–USA–1SAP.



# The CW Guide to Wireless

COST, COVERAGE AND CONVENIENCE

ARE STILL MAJOR HOLES TO WIRELESS

DATA COMMUNICATIONS. WIDE USAGE

WON'T OCCUR UNTIL DECADE'S END.

When the second of the second

# **BY JOE PANEPINTO**

Sure, two-way wireless data communications is here today — if you're intrepid, have vast resources and are able to lay out big bucks to get some needed competitive edge.

United Parcel Service, Inc. is a case in point. UPS spent six years and \$1.5 billion investigating and implementing wireless communications before settling on circuit-switched cellular, according to International Data Corp. Since Federal Express Corp. had gotten the jump in real-time package tracking and mobile data communications, it was do or die.

But UPS had to fight some wireless battles that may be too daunting for smaller firms. For example, to get cellular coverage for the Top 100 U.S. markets, UPS had to negotiate with 23 vendors (and 23 different rate structures, billing increments and billing systems). Today, UPS, and only UPS, has a consolidated billing arrange-

FIRING LINE: USERS APPLAUD PROXIM'S RANGELAN WIRELESS LAN. PAGE 85.

THE MORE YOU GET, THE LESS IT CAN COST. PAGE 82.

ment with those vendors under which it receives a single bill and makes a single remittance each month.

UPS says wireless will pay for itself in new business and customer retention. This is true of most early adopters of wireless, including the transportation industry and field service.

Wireless, page 76

# WIRELESS IS STILL OUT OF REACH FOR MOST COMPANIES

CONTINUED FROM PAGE 75

But the big question is, what will it take for the baton to pass to companics that don't have their feet to the competitive fire?

Wireless "is too expensive, coverage is not broad enough, the applications are not there, the bat-

little hyperbole. But, there is certainly more than a grain of truth to every criticism he has of the wireless data communications market and its limited acceptance across horizontal markets.

At the same time, each of his ontarget criticisms is being addressed aggressively by a variety

of vendors hoping to establish themselves in this still-maturing market. The race is on to make wireless data communications less expensive and more ubiquitous, useful, integrated and convenient.

#### **WIRELESS HURDLES** What are the most significant barriers to wireless? 38% **Too expensive** 14% Lack of applications 10% **Incompatible offerings** 10% Poor ease of use 10% No need for it 7% **Short battery life** Lack of coverage 3% Lack of speed 3% Lack of safety 3% Response base: 78

Source: Buyers' Satisfaction Scorecard

teries don't last long enough and the equipment is too large and clunky," says Dick Schaffer, a principal at Technologic Partners in New York. "Other than that, [wireless] technology is great."

Schaffer may be engaging in a

#### Cost

Currently, the overall cost of equipping the nomadic work force touted in marketing literature is still prohibitive.

Most head-to-head cost comparisons of wireless data transmission focus on cost-perminute or circuit time (for circuit-switched cellular); or per-packet costs (for packet radio from companics such as ARDIS and RAM Mobile Data). But when it comes to

# PUAS ZAT'S

Until recently, the only suppliers of personal digital assistants (PDA) were APPLE COMPUTER, INC., SHARP CORP., TANDY CORP./ CASIO COMPUTER CORP. and AT&T/EO. But more recently, MOTOROLA, INC.'s Envoy has caused a big splash in the PDA market. Unlike earlier PDAs, it is based on GENERAL MAGIC, INC.'s platform and Telescript communications language, which are expected to simplify PDA communications tasks.

Envoy is powered by **MOTOROLA**'s highly integrated Dragon chip set and special-purpose, application-specific integrated circuit, Astro. It will communicate with public and private electronic-mail systems, Windows and Macintosh computers, fax machines and other Envoys. It has two PCMCIA card slots. Infrared communications links let it work with wireless LANs.

**RADIOMAIL CORP.**'s E-mail service and **AT&T**'s PersonaLink services will be offered to Envoy users via their ARDIS connection.

According to **MOTOROLA**, more than 15 third-party applications and services will be developed by the time the product ships this summer. List prices will be less than \$1,500.

APPLE recently expanded the scope of its Newton MessagePad to include new developer tools and computer connectivity. It introduced the Newton MessagePad 110 for \$599 (with triple the memory, longer battery life and faster recharge than the previous version), an upgrade program and upgraded desktop inter-

connect software. Three Newton business software packages from **STARCORE** and a new version of the Newton Toolkit will ship in April. Upgrades for current Newton users will cost \$99. New software developments now allow deferred handwriting recognition; letter-by-letter recognition; faster transfer by infrared; and easier addition of new names to personal word list and names files.



HEWLETT-PACKARD CO. announced its HP Starlink service earlier this month, marking its entry into the wireless messaging market. It will let HP 100LX users transmit voice and data messages, as well as receive the latest news, sports and financial data. Messages are transmitted using SKYTEL CORP. and PACTEL's paging networks. Once signed up, HP Starlink users are accessible via a toll-free number and can leave alphanumeric messages. Callers can send data messages via modem.

Written by Anne Lynch, market analyst, communications division, at BIS Strategic Decisions in Norwood, Mass.

# **WIRELESS CHOICES**

	CELESS GI		PDOWINEDS	ADDUGATIONS	00VED105
PACKET RADIO	Two-way radio frequency-based wireless messaging service. Similar to wired packet-switching networks.	The most broadly accepted wireless transmission method.	PROVIDERS  RAM Mobile Data, ARDIS.	Field services, transportation, public safety; expanding into E-mail through agreements with integrators, VARs.	90% of urban U.S. businesses (RAM Mobile Data); 80% of U.S. population (ARDIS)
CIRCUIT- SWITCHED CELLULAR	Uses existing cellular voice networks. Mobile users can plug portable fax machines into their cellular phones or attach a notebook via specialized cellular modems.	Available in nearly all cellular markets but has severe technical flaws that make it unreliable.	All cellular operators.	Files and faxes served on a secondary basis.	95% of population.
COPS	Delivers data over existing cellular networks at 19.2K bit/sec, by converting data to digital packets. Uses channel hopping or dedicated channel to make use of existing frequency allocation.	In deployment.	All RBOCs; McCaw Cellular, Bell Atlantic, GTE, Ameritech, Nynex and PacTel are significant players.	Short, bursty traffic such as credit-card transactions.	Today: 5% of population. Mid-1995: 75% of population.
one-way Messaging (Pasing)	Low-cost, easy-to-use, one-way data messaging and broadcast technology relying on small message transmission.	Mature.	Embarc (a Motorola company), SkyTel (a subsidiary of Mobile Telecommuni- cations Technologies, or MTel).	SkyTel – executive pager, centralized messaging, 240-char, limit, Embarc – file transmissions, 30,000-char, limit,	90% of the nation; primarily urban coverage.
Lare especial control of the control	Radio technology based on large numbers of low-power microcells. The ubiquity of microcells will require minimal battery power in end-user devices and thus may allow for more miniaturization.	Embryonic. Expected to be launched in late 1995. The FCC has planned an auction for spectrum in the 2-GHz range that would support up to seven PCSs in each metropolitan area.	National Wireless Network (an MTel company).	Two-way data messaging (up to 2K-byte message size).	Nationwide; 300 markets by June 1995.
64 1747 65 1747 1. 125 1. 125	Development of existing SMR infrastructure ing digital technology that allows voice, data, in the estage and paging. Motorola provides with coupment called Motorola Integrated that of System.	Being deployed. Some limited services available by year's end from Nextel.	Nextel, CenCall, DialPage.	Voice, short message, data, paging.	Licensed for 90% of U.S.

justifying the acquisition, installation and maintenance of a wireless data communications system, analysts say this usage expense which averages roughly \$80 per user per month — is just the tip of the iceberg.

Besides, as the market grows, on-line and per-packet costs will continue to drop to roughly \$35 per user per month by 1998, according to Iain Gillott, research manager at Link Resources, Inc., a market research firm in New York.

More important cost barriers in-



clude the up-front costs of equipping all mobile employees with some kind of handheld, laptop or other portable device (roughly \$1,500 to \$4,000), as well as the cost of specialized wireless modems (\$750 to \$1,000 per modem).

The lack of standardization and interoperability among transmission systems complicates the cost picture. Currently, every major wireless service provider supports a different wireless standard, requiring a different wireless modem for each network. Since no single technology offers complete coverage, it's either live with the dead spots or carry multiple modems.

Even if the modems have the credit-card-size PCMCIA form factor (easing the bulkiness issue), the price is still too high. When PCMCIA modeins begin to ship

> from multiple vendors around midyear, they are not expected to be much cheaper than non-PCMCIA modems.

> "My members really want modems with multiple functions," says Gene Hengel, director of strategic technologies at Insurance Value-Added Network Services (IVANS). IVANS is field-testing Cellular Digital Packet Data (CDPD) on McCaw Cellular Communications, Inc.'s AirData network in Las Vegas. "If

you're carrying around a \$3,000 laptop and have to carry around another \$4,000 worth of modems, it doesn't make any sense," Hengel

IVANS is beta-testing \$1,500 IBM ThinkPad 750s that sport integrated multifunction modems from San Diego-based Pacific Commu-

# wireless lans



A dozen or so wireless LAN vendors exist today, including significant communications players such as AT&T GLOBAL INFORMATION SOLU-TIONS (formerly NCR Corp.) and MOTOROLA, INC.; former defense/military contract suppliers such as PROXIM; and LAN players such as BICC.

The market lacks formal standards, with competing systems based on radio frequency and infrared; however, an IEEE committee is working on standardization. Many companies are represented on the committee, including DIGITAL EQUIPMENT CORP. and XIRCOM, INC. Yet another company, AIRO-**NET**, announced its support for the 802.11 standard recently. Another key player is WINDATA.

XIRCOM and DYNA COMMUNI-CATIONS have announced a joint development and cross-licensing alliance they say will deliver mobile connectivity and network printing products for the APPLE COMPUT-

ER, INC. market.

MICROCOM, INC. is now shipping LANexpress, an integrated system for connecting individual and remote users to corporate LANs. The product combines Windows-based client software with a high-performance server that comes standard with up to eight integrated 28.8K bit/sec. V.fast modems. It is available in both Ethernet and Token Ring versions.

— Anne Lynch

nication Sciences, Inc. (PCSI). The modems (marketed by PCSI as Ubiquity 2000 and by IBM as Mobile Communication Modules) support not only CDPD and switched-cellular data communications but also cellular voice, cellular fax, wire-line data (plugging

into standard telephone lines) and wire-line voice.

Other wireless modem vendors have not yet promised multifunction modems, but analysts say consumers can expect announcements before year's end from such

Wireless, page 78

# TWO-WAY MESSAGING AND LOWER-COST TRANSMISSION ARE CHANGING THE MARKET

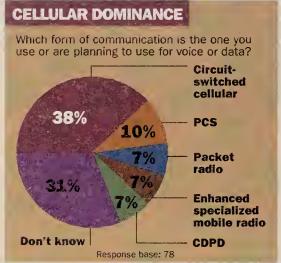
NUMBER OF USERS	COST	MODEM COSTS	USER SERVICE FEES	DOWNSIDE	NOTES
RAM: will not disclose. ARDIS: 35,000 (more than half are IBM, Motorola employees).	Recent pricing changes make it much cheaper than circuit-switched cellular.	\$650 to \$795.	Average \$50/ month plus kilopacket charges.	Reliability in densely packed downtown areas is still an issue.	RAM and ARDIS are backed by significant players.  Both are aggressively upgrading their networks to  19.2K bit/sec., improving coverage and planning to connect to many other network types.
Difficult to track; carriers can't distinguish between voice and data use.	Expensive. User pays for use of entire circuit and incurs new call charges when a circuit is dropped and data re-sent.	Average: \$500; can be subsidized.	Average: \$35/ month plus airtime charges.	Inherent unreliability. Fax works satisfactorily, but RF transmissions aren't ac- cepted by host applications.	Cellular carriers are under increased pressure as other players — CDPD and PCS — enter the marketplace.
No users other than those in trial mode.	Unknown.	\$495 to 1,595. Expected to decrease to \$200 once CDPD catches on.	Kilopacket charges: expect promotional and tiered pricing.	Doesn't exist today.	CDPD has clear advantages over current alternatives. Its role may become more limited as digital cellular networks are built and additional RF spectrum is made available.
16.2 million business users use paging but not necessarily for messaging.	Low cost.	\$200 to \$300.	\$35 to \$50 per month.	Current attention is on CDPD and two-way messaging.	Embarc and SkyTel are currently lobbying the FCC for additional spectrum allocation that could support two-way messaging.
None.	Providers expect it to be the most inexpensive two-way wireless network.	\$200 to \$300.	NA	MCI Communications Corp. turned its sights from PCS to ESMR with a \$1.3 billion investment in Nextel Communications, Inc.	Holds promise of being cheap and very user-friendly but is embryonic. National Wireless Network has a good head start, with "pioneer's preference" authority from the FCC to build a national two-way data network using narrewband. It claims that its construction costs are \$100 million, a fight the invostment required for packet radio networks.
SMR users number in low hundreds.	Expected to provide cellular quality and service for low price.	NA	\$35 to \$50 per month.	Taking on a big competitor, as cellular has large installed base.	With MCI interest in ESMR, Nextel will have access to MCI's subscriber base.

# WIRELESS

CONTINUED FROM PAGE 77

heavyweights as AT&T, Motorola, lnc., Ericsson GE Mobile Communications, Inc. and Rockwell International Corp. The same companies are expected to introduce chip sets to support multifunction personal digital assistants (PDA) that support voice and data in the same device. Analysts saysuch devices for cellular networks may be available by year's end.

Today, only a couple of crossplatform offerings are available, including AT&T's EasyLink and RadioMail from RadioMail Corp. in San Mateo, Calif. For \$89 a month (plus \$99 sctup fee and \$49 for software), organizations can get an unlimited-message service from RadioMail that routes messages over either ARDIS' or RAM Mobile



Source: Buyers' Satisfaction Scorecard

Data's networks. AT&T's service has similar functions and is similarly priced.

Geoff Goodfellow, president of RadioMail, says his company will eventually support the whole range of "wireless clouds" (RAM Mobile Data, ARDIS, CDPD, personal communications services, or PCS, and satellites) once they are commercially available.

In addition, some significant standards activity in the wireless modem arena can ease the cost burden on the wireless end user (see story page 80).

# Coverage

The lack of national coverage from any single vendor is also putting a damper on the widespread adoption of wireless.

RAM Mobile Data and ARDIS offer coverage in more than 90% of the urban business and metropolitan areas in the U.S. However, for some end-user organizations considered prime candidates for wireless systems (such as insurance companies), the lack of coverage outside metropolitan areas and travel corridors is a major problem.

By comparison, McCaw Cellular and its partners' cellular voice

system (which is not yet rigged for CDPD) reaches far beyond urban areas to 96% of the geographic U.S.

"Claims adjusters and auditors need real mobile computing applications, but they often work at sites that are not in major metropolitan areas," Hengel says. Claims adjusters and field auditors inspecting damaged property for claims or evaluating new properties for coverage should be able to walk around a building or property wherever it is and remain connected, Hengel says.

Cellular clearly has the edge over packet-switched radio networks in terms of coverage, but there is a hitch. Although cellular voice service is available pervasively, CDPD is still in testing or pilot phase in only a handful of U.S. cities. Even the most rosy forecasts push CDPD out until at least the end of this year.

Andrew Seybold, editor of in-

dustry newsletter "The Outlook on Mobile Computing," blames McCaw Cellular's unrealistic promises of CDPD's availability for holding back the overall wireless market.

"By convincing computer vendors to wait for CDPD, McCaw has held the wireless market back by over a year," Seybold says. "CDPD, as envisioned by McCaw Cellular, is still at least a full year, if not two, away."

McCaw Cellular originally planned to have rolled out CDPD in 105 cities by midyear. Recently, though, the company announced a six-month slip in those plans.

And even when CDPD becomes available nationally, its cost may hold back the market. Today, cellular voice users outside their contract areas incur roaming charges of up to \$2 per minute. Customers expect the same kind of charges for data and are not happy.

Chuck Parrish, general manager of mobile data at GTE Corp. in Atlanta, envisions a world in which cellular service providers such as GTE, Ameritech Corp., Bell Atlantic Corp. and Nynex Corp. band together to offer coast-tocoast CDPD coverage with no roaming charges. But at this point, it is still a marketing vision and not a promise.

# Confusion

Analysts and vendors alike agree on one thing — perhaps the greatest barrier to the mainstream adoption of wireless technologies is market confusion.

"Right now, this is a very confused and contentious market," says Bennett Kobb, co-founder of Wireless, page 80

founder of

# KILLER APPS STILL ELUSIVE

So far, applications envisioned for widearea wireless and those in beta testing are pretty much vertical applications.

"The way I see the wireless business in the next 18 months and beyond is one where capacity is chasing applications," says Bennett Kobb, co-founder of the Wireless Information Networks Forum and president of consultancy New Signals Research.

Some of the most promising mainstream applications are broadcast information services, transaction services and data distribution and collection, according to Mark Winther, vice president of worldwide telecommunications at Link Resources.

Topping the list, however, is two-way wireless messaging. In survey after survey, users say messaging and access to E-mail are the main wireless applications they would like to see, according to lain Gillott, research manager at Link Resources.

Intel Corp. has been trying to make things easy for message-interested wireless users who don't mind the coverage limitations of RAM Mobile Data's packet-switched radio network. Intel packages the Intel Wireless Modem — which is an Ericsson GE Mobile Communications Mobidem AT wireless modem — with Lotus Development Corp.'s CC:Mail Wireless Pack, Microsoft Corp.'s Mail or AT&T's Mail for use over RAM Mobile

Data's network. The only problem is that few users know about it, analysts say.

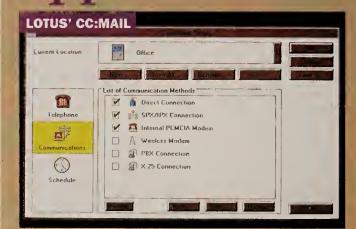
At last month's announcement of Oracle Corp.'s Media Server relational database management system, Oracle and RAM Mobile Data officials said they would announce wireless database products later in the year. Presumably, such systems would support the development of applications specifically designed for remote-user access.

Other announcements fit the same mold—existing applications with a wireless twist. Lotus has promised wireless versions of Notes for CDPD but with no release date.

At Comdex/Fall '93, demonstrations of applications running on McCaw Cellular's CDPD Air Data systems included the Insurance Value-Added Network Services insurance demonstration, a wireless version of American Airline's Sabre customer reservation system and UPS' package tracking—all vertical-market applications.

The key to application availability in the wide-area wireless world, however, is the viability of the infrastructure, according to Andersen Consulting's Richard Siber. Many vendor and end-user companies will wait for such things as standard interfaces to modems and network protocols before they develop applications for wide-area wireless systems. — Joe Panepinto

# applications



**LOTUS DEVELOPMENT CORP.** and **MICRO-SOFT CORP.** both offer wireless versions of their popular electronic-mail packages.

LOTUS is also developing two-way messaging with MCCAW CELLULAR COMMUNICATIONS, INC. for CDPD and has released the Lotus Notes Pager Gateway with SKYTEL CORP.

**SKYTEL** can also connect via special software with Microsoft's Mail, WordPerfect Corp.'s Office and other leading E-mail packages.

RAM MOBILE DATA supports CE SOFT-



**WARE, INC.**'s QuickMail for Macintosh users, as well as other leading E-mail systems.

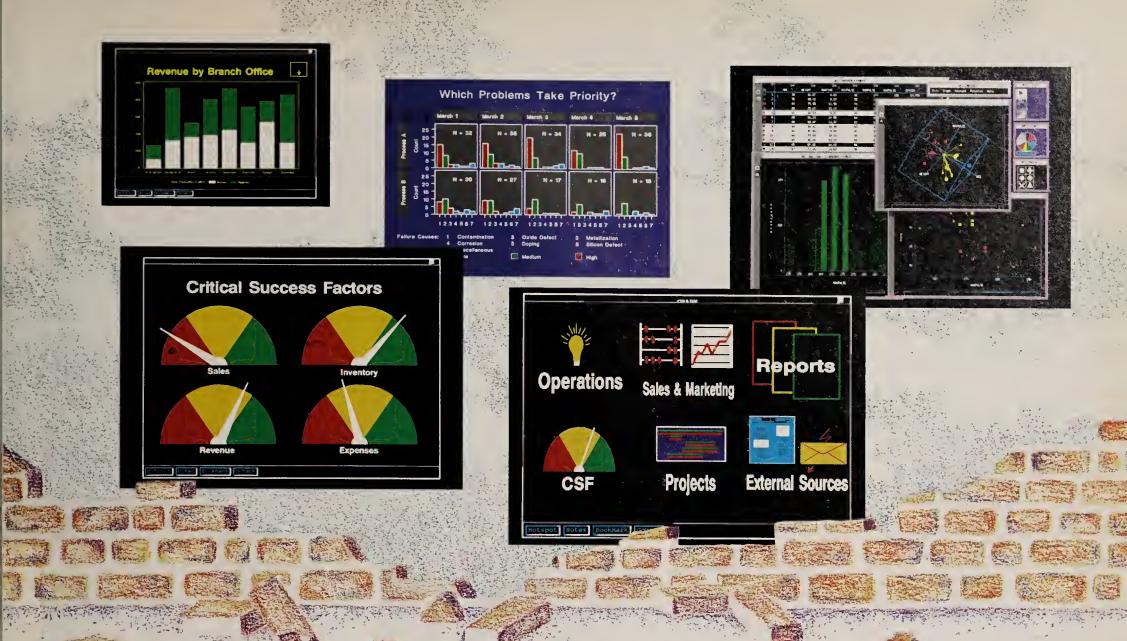
AT&T and MOTOROLA, INC. will develop a gateway between AT&T PersonaLink Services and Motorola's Mobile Networks Integration (MNI) for value-added wireless transport services. MNI also accesses users on Ardis, RAM Mobile Data and Embarc.

This will allow users to

shop, work and meet electronically, courtesy of **GENERAL MAGIC**, **INC**.'s Telescript technology. Any user device based on General Magic's MagicCap will operate on AT&T PersonaLink, but the service will not be confined to General Magic platforms.

EX MACHINA, INC. has developed Pocket Call, which will let users of MagicCapbased personal communicators tap into thousands of on-line services, such as news, weather, financial quotes, home shopping and automatic check payment.

— Anne Lynch



# Break Down the Barriers Between People and the Information They Need

# With the SAS® System— The World's Leading Information Delivery System.

A lot of obstacles stand between your organization's two most important assets: *people* and the *information* they need to make better decisions. With the SAS System, you can deliver the right information to the right people at the right time. Every time. And you can break down all the barriers created by...

# **Diverse Data Sources**

The SAS System turns your organization's "islands of information" into generalized resources available to any user or application—no matter where or how data are stored, from popular databases to remote external files.

# **Diverse Applications**

The applications that drive your enterprise are fully integrated in the SAS System—everything from EIS and decision support to financial analysis and reporting to quality management. This comprehensive approach eliminates the need for single-shot software solutions that have made a patchwork quilt of your applications strategy.

# **Diverse Client Needs**

The specific needs and experience level of every client—from new computer users to seasoned pros—are met through personalized interfaces. Take advantage of iconbased executive information systems, point-and-click

menus for business analysts, an object-oriented applications development environment, or a full-screen display environment just for programmers.

# **Diverse Computing Platforms**

The SAS System maximizes the effective use of your entire computing mix—from PCs and workstations to minicomputers and mainframes. You'll have true hardware independence—without sacrificing your ability to exploit the particular advantages of specific environments. Plus the ability to implement cooperative processing by segmenting applications any way you choose.

For your free video introduction to the SAS System, give your Software Sales Account Manager a call today at 919-677-8200. Also ask for details about the free SAS System Executive Briefing—coming soon in your area.



SAS Institute Inc.
Software Sales Division
SAS Campus Drive ☐ Cary, NC 27513
Phone 919-677-8200 ☐ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1992 by SAS Institute Inc. Printed in the USA.

# WIRELESS

CONTINUED FROM PAGE 78

Wireless Information Networks Forum and president of consultancy New Signals Research in Arling-

If you thought the breakup of Ma Bell left organizations with a confusing array of choices for voice scrvices, take a look at the lineup of wireless data service vendors and technologies.

By year's end, radio frequency, cellular-switched and paeket vendors could conceivably be joined by the following:

•Satellite options when American Mobile Satellitc launehes a geostationary Earth-orbiting satellite in July. Since each satellite has such a huge footprint, satellite systems could all but eliminate the coverage issue.

• PCSs for voice and data. Current plans are for the Federal Communieations Commission to auction spectrum for PCS use on May 7. The new spectrum allocation would allow room for up to seven new voice and data companies in each eellular ser-



vices market, which currently supports only two.

•Expanded "microcellular" offerings from eompanies such as Microcom, Inc. in Los Gatos, Calif., which built a wireless network for Apple Computer, Inc. and the city of Cupertino, Calif. Microeellular systems use low-powered cellular technology to connect companies or organizations in a metropolitan

· Paging vendors such as SkyTel Corp. and Embare Communication Services, which expect additional spectrum allocation for twoend.

"With so many competing technologies and vendors, there is some paralysis across horizontal markets," says Greg Pellegrino, director of mobile computing at the Mucrean Management Systems Cuttrfo. Advanced Technologies

Valy 8 84y that paralysis may end where coPD rolls out for the s riple reason hat people are fair-

ly comfortable with cellular voice and are likely to trust it with cellular data.

At the same time, better developed independent software vendors, value-added resellers and other distribution and systems integration channels may also play a role in making people more comfortable with wireless solutions. Today, very few companies (Wireless Teleeomm, Inc. in Englewood, Colo., is one exception) focus exelusively on helping eustomers weigh their options in the wireless world and pull together an integrated system.

Most experts agree that wireless will not become a mainstream technology until mobile professionals can get to the data they need when they need it, no matter where they are.

# Wireless smarts

The future of wireless, according to Richard Siber, director of wireless for the Americas at Andersen Consulting, is in such things as an intelligent networking service that, in conjunction with a multifunction handheld device, will choose the lowest-cost routing alternative over different wireless systems. Modems will be multi-

functional, as will portable devices, which will resemble a combination of PDAs and telephones.

> Hardware makers are coming from two directions and converging on a single personal intelligent communications device: IBM and BellSouth Corp.'s Simon is a handheld telephone enhanced with some data capa-

bilities; Motorola's Envoy is a handheld computer that will include some voice functions, according to Roberta Wiggins, direcof wireless mobile communications at The Yankee Group in Cambridge, Mass.

A typical application for this system will be global positioning services that feed information to your wireless device or allow you direct access to databases, based on your location, Siber says.

But before any of this can even begin to appeal to the mainstream market, costs need to fall signifieantly, Seybold says.

Wireless wide-area network monthly service costs must drop way communications by year's from roughly \$80 per month to less than \$20 per month; the cost of wireless modems must drop from more than \$750 to less than \$300 (comparable to standard wire-line modems).

Coverage issues also need to be settled. And, perhaps most importantly, the market has to be a whole lot easier to understand.

Panepinto is a free-lance writer in Amherst, Mass.

# **MODEM STANDARDS ARE A LINCHPIN**

You can call it the calm before the storm. Before competition gets hot and heavy in wireless modems, vendors are first attempting to converge on standards that will lay the groundwork for the war to come.

"We realized we have to engage in some market-building activities right now instead of continuing to fight over market share," says William Frezza, chairman of the Portable Computer Communications Association (PCCA) modem standards committee and director of marketing and business development at Ericsson GE Mobile Communications.

"Later on we can bash each other over the head over market share," Frezza says. "Right now we have to make it cheaper and easier to use wireless across markets."

PCCA membership includes Advanced Micro Devices, Inc., ARDIS, Lotus Development Corp., Microsoft Corp., Motorola, Inc., Intel Corp., Rockwell International Corp. and RAM Mobile Data.

Earlier this month, the group closed its second ballot on adopting an extended version of the standard Hayes AT command set for use in wireless modems. A standard interface between computers and wireless

modems will hasten a drop in modem prices and eliminate the need for multiple modems.

Support for the wireless AT command set allows software developers to write software that will run over multiple networks switched cellular, CDPD and packet radio. This reduces the cost of entry for vendors hoping to make their software work over wireless and diminishes the internal IS cost for companies tweaking their own applications to run over wireless.

It also may help jump-start application development for wireless because vendors, VARs, independent software vendors and end-user organizations developing software won't be betting on the success of a single wireless network technology. Work is already under way at PCCA on a frame-based standard for wireless modems.

As for data and connection reliability over wireless networks, modem vendor Microcom, Inc.'s MNP 10 has proved to be a very promising technology, as has AT&T's ETC (Enhanced Throughput Connections). MNP 10 has been licensed to more than 40 modem vendors, and Rockwell has made it standard in its V.32 bis and higher chip sets.

-Joe Panepinto

# modems



Key wireless data modem suppliers are MOTOROLA, INC., with the ARDIS Infotac, ERICSSON GE MOBILE COMMUNICA-TIONS, INC., with its Mobidem for RAM Mobile Data, and INTEL CORP., with its Wireless Modem for RAM Mobile Data

BELL ATLANTIC CORP. has introduced AirBridge, a cellular modem protocol conversion service. It provides four data services: AirBridge Gateway, a modem-pool service that tackles incompatibility problems between remote cellular modems and landline modems; AirBridge Packet for CDPD transmission; AirBridge Fax for text and image transmission to and from mobile fax machines; and AirBridge Circuit-



Switched Solutions for remote E-mail and telemetry.

More news is occurring on the CDPD front: PACIFIC COMMUNICATION ENCES received a major purchase order from the IBM PC Co. for the production of a multifunction CDPD modem for IBM's ThinkPad 750 series. Communication's Ubiquity 1000 lets users send data wirelessly over CDPD and regular circuit-switched

cellular or via landline data/fax modems.

ARDIS has announced an extension of its reach with news that RACOTEK, a Minneapolis-based specialized mobile radio operator, has developed wireless networking software that will interface with customer applications. ARDIS also introduced a software package equipped with personal messaging software so users of Motorola's Infotac modem can send and receive messages from notebooks and desktops in Windows environments. Future platforms include APPLE COMPUTER, INC.'s Newton and Macintosh, GENERAL MAGIC, INC.'s MagicCap and platforms from HEWLETT-PACKARD CO. —Anne Lynch

HIBTORS THOUGH ENDS IND HIBTORS TOTORIAL STREET HID HIRES THOUGH SPECTATION

COMING MAY 2-6, LAS VEGAS. PRE-REGISTER FREE! SAVE \$50!

# THE NETWORKING EVENT OF THE YEAR IS

# Announcing the most important networking and computing event ever held.

Networking changes minute-to-minute. LAN, WAN and telecommunications are converging into a single all-encompassing business environment—connecting not only desktop to desktop, but company to company.

NetWorld™+Interop® 94, The Networking Summit, was created specifically to mirror these changes.

This unique forum puts together the two biggest names in networking events. NetWorld, the hallmark of the desktop LAN community. And Interop, the proving ground of interoperability for the WAN and telecom worlds.

What you get is the first truly all-in-one networking forum.

# The Summit for Networking Professionals.

NetWorld+Interop 94 is the gathering place for the industry's best and brightest. Only NetWorld+Interop 94 offers you this

comprehensive educational

- experience free:

   The InteropNet, featuring a guided tour of industry's only live multi-vendor, multi-protocol network that mirrors the inter-
- operability challenges you face today.

   Internet Showcase, where you can learn about the richness and diversity of the Internet.
- *Start-Up City*, an exhibit area dedicated to showcasing innovative new products and solutions from emerging companies.
- Configuration Clinic, where you can get suggestions for designing and

configuring your network from the best in the business.

- CNEPA Labs, a forum for the transfer of technical information from the vendors to the network computing professional.
- *TSANet*, where Technical Service Alliance members join together to solve your biggest networking challenges right on-the-floor.
- Solution Showcase Demonstrations, cooperative technology demonstrations by leading vendors including ATM, APPN, Fast Ethernet and Multimedia.

You will see the hottest new technologies demonstrated by more than 600 of the world's leading networking companies. You'll leave the show ready to make the best possible buying decisions for your company. Because when you see it at NetWorld+ Interop, you know it works!

# Don't wait. Pre-register now and attend FREE!

NetWorld+Interop 94 Las Vegas takes place May 2-6, 1994 (exhibits open May 4-6) at the Las Vegas Convention Center. For more information and details on how to attend FREE (a \$50 savings), or to become an exhibitor, call 1-800-488-2883 Ext. 311.

Outside the U.S., call 415-578-6900, or contact us over the Internet at networld@interop.com.\*

Don't miss this unparalleled chance to experience the best in networking.

\*More information is available through the op's Gopher Server at programs interoption, ar Worl, Wide Web (URL http://programs.interoption)

NetWorld+Interop 94 is produced by Interop Company, Interop is a registered trademark and Configuration Clinic, Internet Showcase, InteropNet and Solutions Showcase are trademarks of Interop Company; NetWorld is a service mark of Novell, Inc. @1994 Interop Company, 303 Vintage Park, Foster City, CA 94404. 415-578-6900. Fax: 415-525-0221. Illustration by Kenneth Gilliam Associates/Michael Kunisaki.

# **WIRELESS: MORE FOR YOUR MONEY**



By Andrew Seybold

Our company has used wireless since the mid-1980s, and we've found something interesting: Total monthly costs

have remained the same — or even

decreased — as we have added more capability to our stable of wireless tools.

Our first cellular phone cost just over \$1,000, and our monthly cellular bill was about \$400 per month. About four years ago, we added a nationwide pager to our wireless inventory. Our unit worked on the SkyTel nationwide network, and we could receive numeric pages almost any-

where in the U.S.

The first SkyPager we bought cost just under \$100, and monthly service ran about \$40 per month. The first month, our combined bill for the pager and phone was just under \$400, so the pager service did not cost us anything.

Why? Because we stopped giving out our cellular number. When people page

you instead of calling your cellular number, charges for incoming calls are climinated. Plus, you decide who to call back and when. If the call isn't urgent, it can wait until you are near a telephone.

During the next year, our monthly cellular bill continued to decrease until it averaged about \$300—a savings of \$100 per month.

About a year and a half ago, we added a wireless data system. Our unit is an Ericsson GE Mobidem (wireless modem), coupled with a Hewlett-Packard HP 100LX handheld computer. The cost of this combination was about \$1,200—less today—and unlimited monthly service was \$89, so the total monthly charge was still under \$400.

With the new HP unit, we began using wireless E-mail in place of much of our voice traffic, which is more efficient: We find we receive more complete responses with E-mail than with voice.

Recently, we replaced our numeric SkyPager with an alphanumeric unit. Even with expanded pager capabilities (our clients and office can now send a one-way message to our pager), our total monthly cost of being wireless is less than \$300 per month for the combined use of all three devices.

Customers, my office and others can send alphanumeric messages or simply their phone numbers to my pager by calling an 800-number and entering Touch-Tones. They can call another number and dictate a message or send their message directly from their computer if they have the software. They can send wireless E-mail if they have access to the Internet

The SkyPager system sends headline news twice a day, and I can access Radio-Mail's NewsFactory via my wireless Email system anytime to find out about current events. I have developed an Email network of other users in the industry, and we send and receive messages about what is happening, what we think is important and its implications.

All of this — for less than \$300 per month.

Seybold is editor of industry newsletter "The

Outlook on Mobile Computing."

# RemoteWare





If you can't even get internal agreement on what an automated

workflow system is, getting one off the ground for the aid and betterment of your mobile field force is probably an even more remote possibility. And while your techies down the hall can quote you chapter and verse on client/server technology, collaborative knowledge sharing, or remote LAN access, has anyone brought you a systems approach smart enough and simple enough to work out there on the road?

So let's talk "time out" here, let's talk reality, let's talk free seminar with some very frank discussions about fleet computing applications and dozens

ORDER ENTRY

of organizations just like yours that have already implemented successful field communications systems that actually do automate their most remote and/or mobile business transaction processes.

We're talking centrally created and managed electronic forms, documents, and reports. all invisibly linked to central systems and databases, neatly supported by integral electronic software distribution capabilities and eminently usable by even your most computer-shy folks in the field. All of which could make your day-to-day business life a little less of a ball-and-chain existence.

All courtesy of the free Remote Possibilities Seminar, and the fabulous RemoteWare\* family of software tools from Neelle Net. Now playing at a major metropolitan area near you:

FOR INFO, CALL 1-800-322-3366.

XCELLENET"

AUTOMATING REMOTE POSSIBILITIES.

# CORPORATE RECRUITERS

Plan to Attend:



June 12-15, 1994
Scanticon Conference Center & Resort
Suburban Denver, Colorado

1-800-488-9204

For more info or to be placed on the conference maining ist

Whether you're delivering strategic sales information, handling customer inquiries, or managing an acquisition, discover how to integrate all your IT systems into a single, powerful information resource.

# CORPORATE COMPUTING SOLUTIONS

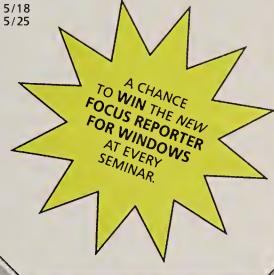
Albuquerque, NM	4/06	Montreal (English), PQ	5/10
El Paso, TX	4/07	Portland, OR	5/10
Orlando, FL	4/07	Albany, NY	5/10
Little Rock, AR	4/07	Iselin, NJ	5/10
Secaucus, NJ	4/07	Detroit, MI	5/10
Boca Raton, FL	4/12	Montreal (French), PQ	5/11
Long Beach, CA	4/12	Colorado Springs, CO	5/11
Boston, MA	4/12	Tallahassee, FL	5/12
Hartford, CT	4/12	Indianapolis, IN	5/18
Oklahoma City, OK	4/12	Springfield, MO	5/18
Cincinnati, OH	4/13	Boulder, CO	5/18
Wichita, KS	4/13	Kansas City, KS	5/19
Tulsa, OK	4/13	East Lansing, MI	5/24
Halifax, NS	4/14	Richland, WA	5/24
Salt Lake City, UT	4/20	Louisville, KY	5/25
Ottawa, ON	4/20	Nashville, TN	5/28
Charlotte, NC	4/21	Sacramento, CA	6/01
Columbus, OH	4/26	Bellevue, WA	6/09
Cleveland, OH	4/26	Tacoma, WA	6/15
Des Moines, IA	4/26		
La Jolla, CA	4/27		
St. Louis, MO	4/28		
Honolulu, HI	5/03		
Las Vegas, NV	5/03		
Birmingham, AL	5/04		
Tampa, FL	5/05		
Toronto ON	EIOE		

Unleash the full power and productivity of desktop reporting and decision-support in a hands-on workshop created exclusively for FOCUS users.

# DESKTOP ENTERPRISE REPORTING WORKSHOP

Greensboro, NC	4/07	Dallas, TX
Florham Pk., NJ	4/14	Denver, CO
San Jose, CA	4/27	Houston, TX
Seattle, WA	4/28	New York City, NY
Toronto, ON	5/03	Columbus, OH
Baltimore, MD	5/04	Memphis, TN
Richmond, VA	5/11	• •
Atlanta, GA	5/12	
Minneapolis, MN	5/17	
Chicago, IL	5/18	
Jacksonville, FL	5/18	<b>^</b>

Burlington, MA



6/01 6/02

6/08

# FREE HALF-DAY SEMINARS

GET REAL LIFE SOLUTIONS TO TODAY'S BUSINESS PROBLEMS. REGISTER TODAY!

Actual case studies with solutions that work! Get the What, Why, and How on delivering corporate data to those who need it, throughout the enterprise, in the most efficient, cost-effective way possible.

Toronto, ON Stamford, CT

> An information-packed "how-to" presentation. Learn real life rightsizing strategies, including data and application migration, client/server, and open systems.

# BUILDING CLIENT/SERVER SOLUTIONS

Denver, CO	4/06	Anchorage, AK*	5/19
Bellevue, WA	4/07	Orlando, FL	5/20
San Francisco, CA	4/12	Boston, MA	5/31
Los Angeles, CA	4/13	Washington, DC	6/01
Phoenix, AZ	4/14	Hartford, CT	6/07
Detroit, MI	5/10	San Antonio, TX	6/08
Cleveland, OH	4/26	Houston, TX	6/09
Louisville, KY	5/12		
Atlanta, GA	5/18		



**CALL Now** TO REGISTER! 800-944-2900

(9 am - 5 pm EST)

# THE RIGHTSIZING ROADMAP SEMINAR

New York City, NY	4/05
Waltham, MA	4/06
Stamford, CT	4/07
Washington, DC	4/12
Atlanta, GA	4/13
Miami, FL	4/14
Denver, CO	5/03
Dallas, TX	5/04
New Orleans, LA	5/05
Iselin, NJ	5/17
Pittsburgh, PA	5/18
Philadelphia, PA	6/02
Omaha, NE	6/07
Woburn, MA	6/08
Indianapolis, IN	6/14
San Jose, CA	6/15

**Information Builders** 

\*Guest Speaker not available



# ONE NETWORK IS BETTER THAN TWO.

A traditional router-based architecture forces you to build two networks to bring in traffic effectively from remote locations. One network for your LANs — and another, parallel network for everything else. That's why GDC's Office Communications Manager (OCM) is making



such a splash. This unique router blends all traffic from the branch onto a single digital link. Ethernet, Token Ring, SNA, and frame relay are supported by dynamic bandwidth allocation, while other networking techniques support voice, video, and legacy data streams. So you save on equipment and transmission costs, and reduce network complexity. Before

adding one more parallel network, call GDC today for a better solution at +1-203-792-0542. We'll send information on OCM, plus

"Creating Networks Without Parallel," a brochure on GDC's unique architecture. In North America, call toll-free at 1-800-777-4005.

General DataComm



# Proxim's RangeLAN: Worth the cost for niche applications

# RangeLAN

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- Proxim's RangeLAN is a wireless LAN that provides high reliability and data integrity, according to evaluators.
- Performance, pricing and technical support are adequate for their needs, they added.

ireless LANs are not exactly ubiquitous in today's computing, but they are making inroads for specialized and niche applications. In addition, new wireless standards announced last week should boost acceptance.

Our evaluation of the RangeLAN product family from Proxim, Inc. in Mountain View, Calif., revealed that improved technology is making wireless more acceptable for some applications.

The evaluators who participated in this survey included technical managers and consultants from a grocery chain, a medical services company, a nonprofit advisory group and a trucking firm. All were engaged in active use and implementation of RangeLAN systems, and all were beta-testing the high-speed RangeLAN2 product line, slated to ship in April.

The format for this evaluation was designed with assistance from Howard Rubin Associates and Technology Investment Strategies Corp.

# Installation

RangeLAN adapters — available for the XT/AT bus, parallel ports and PCMCIA cards — are easy to install, according to the evaluators.

All reported that initial installations took less than an hour, including reading the manuals. Subsequent installations could be done in a few minutes. Software installation on both clients and servers was equally simple, consisting only of adding device drivers to the systems.

Medical services company: "It's no problem. It takes less than 15 minutes, and the first time, less than an hour."

# Reliability

It is difficult to imagine the airwaves as a reliable conduit for LAN data, but RangeLAN worked well and without failure, evaluators said. Within the scope of its operating range—500 feet—they reported no downed connections or interrupted communication. The grocery chain added optional antennae to boost reliability.

Grocery chain: "Once I put the bigger antennae on, that resolved" reliability problems.

# Performance

The evaluators had mixed reviews on performance. They said the older RangeLAN was adequate for low-volume data links, such as simple data-entry screens. The newer RangeLAN2 products provided much higher performance.

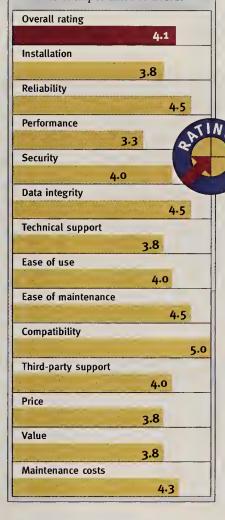
Advisory group: "It's very much like a virtual hard disk. We can transfer a 500K-byte file in a couple seconds."

# Security

All RangeLAN products perform data scambling in hardware, so no unsecure data crosses the airwaves. The evaluators reported no problems.

# **PROXIM'S RANGELAN**

Ratings are based on user expectations on a 1-to-5 seale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



Medical services company: RangeLAN "has several different channels, so you just find the channel you want to use."

# **Data integrity**

All Range LAN devices use a media access protocol and logical link controls to maintain data integrity.

Grocery chain: "Either we got it good, or we didn't get it at all."

Advisory group: "In benign environments where the issue is dis-

# tance, we're happy."

Technical support

The evaluators said technical support from Proxim ranged from adequate to good.

#### Ease of use

RangeLAN is a transparent communications media, the evaluators said. They could run packaged Windows software across their systems, and writing custom applications presented no special programming issues.

#### Maintenance

RangeLAN required no maintenance, the evaluators said.

Medical services company: "You don't have to maintain anything on it."

#### Compatibility

There were no reported difficulties running either packaged or custom software, according to the evaluators. In addition, they were able to run communications software such as Procomm Plus with surprisingly little difficulty.

Grocery chain: "We ran Windows through it and PC Support for AS/400. We ran a lot [of software] while testing it."

# Third-party support

The evaluators said there was little need for third-party support services or products.

# Price

RangeLAN adapters cost from \$495 to \$695. A bridge adapter to connect RangeLAN systems to Ethernet domains is roughly \$2,000, depending on options. The evaluators reported spending \$3,000 to \$50,000 on RangeLAN systems. They considered pricing to be reasonable and somewhat lower than alternative products.

Grocery chain: Competitors "are more expensive and don't perform much better."

# Value

RangeLAN is a good value, the evaluators said. Although substantially more costly than wired networking, RangeLAN was much more suitable in very specific applications where standard LANs simply wouldn't work, they said.

Written by Computerworld senior editor Garry Ray.

# Proxim responds

Mack Sullivan, Proxim's director of marketing, responded to issues raised in this evaluation:

Limitations: A fundamental trade-off [with wireless] is that of range vs. speed. Distances of 300 to 600 feet are a reasonable limit. Also, people will be hesitant [to use wireless LANs] un-

til a standard exists. That will probably be another year.

► Cost: The volume [for wireless LANs] is now very low, but as ecomonies of scale occur, that will drive down costs.

Over the next one or two years, there will not be much price degradation. But over the next three or four years, we will see significant volumes shipping for mobile computing. Prices will drop.

# In Depth

# SOFTWARE Problem

# SOUND OFF!

AT ISSUE: Depending on who you believe, faulty software is either a serious problem or just another way for lawyers to line their pockets. Two attorneys take up the argument.

# RY WONALD I PATENCE

# Competition, not litigation, ensures quality systems

The problem of faulty systems is not as widespread as certain lawyers would have you believe. In fact, the zeal with which many law firms are going after such cases may in the end harm users and vendors more than faulty systems. Competition, not litigation, ensures quality systems.

I believe software and systems reliability has probably increased in the past 15 years. The legal system is evolving appropriately to deal with computer software and systems problems. Best of all, the fiercely competitive nature of the technology marketplace is imposing more discipline on the vendor community than a phalanx of lawyers ever will.

My evidence for systems reliability is largely circumstantial. Fifteen years ago, the hottest topic in computer law circles was how with litigation, to get around implied warranty disclaimers and other limitations of liability found in the standard vendor contract. Successful litigators who had pleaded eases based on fraud or misrepresentation were regarded as folk heroes, eagerly sought after to recount their victories at seminars and conferences.

Today, the action has shifted to intellectual property disputes, with relatively modest attention paid to contract litigation

This decreased emphasis on computer contract questions in computer law circles suggests that the problem of seriously flawed systems—not uncommon in the late 1970s at decrly 1980s—has abared it suggests, too, that there is a well-established base of legal options for users who want redress for flawed software or systems.



Ronald Palenski: 'The strict liability standards some plainliffs' lawyers are looking for will only increase costs for software and systems consumers'

The most basic of options is the Uniform Commercial Code, the law applicable to "transactions in goods" in all states (except Louisiana). This law, which governs the formation of contracts, warranties and remedies, has been applied to computer software, integrated hardware/software transactions and even to computer service transactions. While the courts haven't gone so far as to recognize "computer malpractice," they have found vendors liable for fraud and misrepresentation.

in this way, laws applicable to commercial and consumer transactions are generally being applied equally to software and systems transactions, providing buyers with recourse when necessary.

If today's software and systems are more reliable — and I believe they are — it's because vendors and customers are becoming increas-

ingly sophisticated in identifying requirements and contracting accordingly. The intense competition in the software and systems marketplace ensures reliability as well.

In 1994, software and systems customers, whether corporate or individual, have more experience in using computer systems; hence, they better understand their needs and can incorporate their software and systems requirements in contracts where they will be regarded as express warranties. The quality movement, too, has helped. It has heightened awareness of the need to study and simplify the work processes that are being automated — a phenomenon recognized by corporate customers and savvy systems integrators.

More than anything else, however, competition in the software and services marketplace

Palenskl, page 88

# or puffery?

BY BRUCE A. BIERHANS

# Responsible lawsuits keep vendors honest

I am not a gladiator on a mission to harm hardware or software vendors. What I am is a trial lawyer who believes that responsible lawsuits protect users from poorly designed software and systems.

Product liability law has been around for some time. Before such law evolved, steam vaporizers tipped over and scalded children; industrial and consumer products lacked "dead man" switches; and automobiles were not crashworthy. Product liability cases helped bring about better-designed, safer products. Plaintiffs' attorneys help advocate accountability.

Computer performance litigation is certainly not new. The widespread use of computers has dramatically increased the scope and nature of the damage that faulty systems can cause.

I recently settled a case in Massachusetts in which we alleged that a financial institution became insolvent because of a faulty turnkey computer system. The company claimed that defects in the applications software caused errors in the integrated general ledger system, passbooks and loan statements, which resulted in dissatisfied depositors withdrawing more than \$5 million.

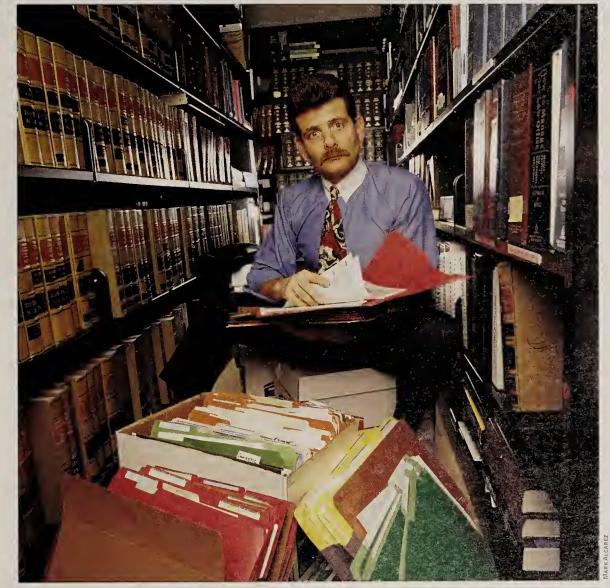
I am currently consulting for a Texas financial institution that has endured similar problems with another vendor.

Just pick up *The Wall Street Journal* and you'll find, in a recent edition, a story about a Boeing 747 that lost altitude and made an emergency landing because of an alleged defect in the plane's autopilot system. The *Journal* also reported on a carpet company that allegedly suffered a \$37 million loss because of a purported failed computer system.

Users need to protect themselves as never before, and that means serutinizing contracts. Vendors generally have succeeded in limiting their liability through restrictive warranty disclaimers in vendor/user contracts. Although many institutional users are sophisticated enough to negotiate a better bargain, vendors often insist on standard vendororiented boilerplate agreements.

To get around restrictive contract provisions and protect users, aggressive trial lawyers have had to allege fraud, negligent misrepresentation or violations of a particular state's consumer protection statute. However, in taking this route, plaintiffs' attorneys face a challenge to satisfy the requisite burden of proof.

Accountability is the key. Professionals such as doctors, lawyers and architects are legally responsible if their conduct deviates from established standards of care and causes damage. Product manufacturers are just as legally re-



Bruce Bierhans: 'Users should absolutely hold the rendor responsible for damages caused by a defective system'

sponsible. These manufacturers can be held liable, without proving negligence, if their products are defective and unreasonably danger-

Computer software and systems manufacturers must be held equally accountable, particularly when you consider the catastrophic personal or financial injury a faulty system can cause. What if a structural engineer uses a software program that miscalculates stress loads in a building? What if a retailer's computer processes customer orders incorrectly?

Software vendors have argued that particular software programs, such as a disaster recovery software program in a nuclear power plant, are so complex that you couldn't hold the system designers liable. To the nuclear power plant's neighbors, that argument is specious and unsatisfying.

Product manufacturers know all about riskutility analysis: If the risks inherent in the design of a product outweigh the benefits of that particular design, then you design the product differently. Make the product safe (or safer), or don't make it. If a vendor can't give a user reasonable assurances that a software product will be bug-free, users should absolutely hold the vendor responsible for damages caused by a defective system.

Accountability will spawn better-designed software products. The mere possibility that they may be held liable for damage caused by defective products that could have been more carefully written or designed will force vendors to be more eareful.

Furthermore, this silent threat may promote the development of acceptable nationwide Bierhans, page 88

# Palenski

CONTINUED FROM PAGE 86

has intensified, giving buyers greater leverage in dealing with the vendor eommunity. Customers are demanding open and interoperable systems with highly reliable eomponents. The vendor that does not heed the marketplace does so at its peril.

Today, the market is ruthless in eliminating the inattentive, unresponsive vendor

as it should be. Despite society's litigiousness, ours is primarily a market eeonomy, rooted in the belief that vigorous eompetition among many providers will yield a variety of superior products and services at the lowest possible priees. Only when marketplaee diseipline

ing business, diverting searee human and financial resources from vendors and users alike. As Abraham Lineoln, a superb trial lawyer, onee eounseled:

fails should we re-

Litigation rais-

es the eost of do-

sort to lawsuits.

"Diseourage litigation. Persuade your neighbors to compromise whenever you ean. Point out to them how the nominal winner is often a real loser — in fees, expenses and waste of time. As a peacemaker, the lawyer has a superior opportunity of being a good man. There will still be business enough."

The striet liability standards some plaintiffs' lawyers are looking for will only increase eosts for software and systems eonsumers. After all, someone will have to bear the financial burden of inereased testing, liability insurance and the like. Yes, we can have foolproof software and fail-safe systems, but how

We have sufficient laws and more than enough litigation. Let's get on with the business of getting on with business.

Palenski is a senior viee president and general eounsel at the Information Teehnology Association of America (ITAA), an association of computer industry vendors. The views expressed in this article are the author's and not necessarily those of the ITAA or its members.

much are we willing to pay for them?



CONTINUED FROM PAGE 87

standards for software programmers.

For their part, individual users and eompanies ean proteet themselves during the contract negotiation stage. Users must become more sophisticated about assessing their data processing needs. They have to force vendors to stand behind their products and accept responsibility for reasonably foreseeable damages system defeets might eause.

Users ean make sure that their attorneys include provisions in their eontraets that eover product requirements, user expectations, vendor responsibilities and remedies that take into aecount the needs of both parties.

Computer performance liability insuranee may prove helpful as well. Such insuranee is eurrently available but very expensive. Even so, I was recently eontaeted by a national actuarial firm that is eonducting a study on behalf of the insuranee industry about the feasibility of writing liability insurance. Apparently, vendors have expressed a keen interest in such insurance.

I believe that heightened vendor aeeountability and sophisticated users translate into better software products and less, rather than more, litigation.

Bierhans is a trial lawyer in Boston and the head of the Computer Vendor Liability Group at the Association of Trial Lawyers of America.



Advertise in the April 25th Mid-Western Edition when Computerworld's regional Careers feature examines 'IS Careers in St. Louis." Ad Close: April 21.

800 343-6474, x201



Client/Server
Database Solutions

It's available now—ready to perform on your desktop. A new function-rich, 32-bit relational database you can really trust with your growing client/server network, your mission-critical data and your business.

with your growing client/server network, your mission-critical data and your business.

Introducing IBM DATABASE 2™ OS/2® (DB2/2™) from IBM Programming Systems, the

birthplace of relational database technology.

DB2/2 includes an industrial-strength DB engine that supports transaction management, concurrency control, security, integrity, and recovery functions. Designed to exploit the power and open architecture of OS/2, it also supports industry-standard SQL for developing portable applications. And it runs your DOS,

DOS Windows<sup>™</sup> and OS/2 applications requiring online access.

You can access data directly from DB2/2 on your desktop or from a DB2/2 server on your LAN, and with

DISTRIBUTED DATABASE
CONNECTION SERVICES/2,™
from DB2, SQL/DS,™ and OS/400°
databases as if they were on your desktop, too.
This versatility can play a significant role in
an Information Warehouse™ solution
for your business.

We've developed an

exciting demo diskette to show you just how well new DB2/2 performs—right on your desktop. Call us today for your free demo, or to order DB2/2: 1 800 342-6672; or fax: 1 800 445-2426. In Canada, call 1 800 465-7999, ext. 850. An upgrade from OS/2 Extended Edition

or Extended Services is also available.





# Introducing Borland InterBase 4 The first upsizing server

Today, more business-critical applications are running on desktop systems than ever before. So the need to "upsize" these systems to client/server—for increased security, reliability, and information throughput—is greater than ever. That's why more companies are making the move to client/server with Borland InterBase 4. You get all the data integrity, security and performance of

a powerful SQL database server, plus the reliability and ease of use normally found only in PC tools.

# Leverage your existing code and knowledge

Paradox® data moves right into InterBase® with only minimal changes to your applications. Users and developers alike gain increased reliability and throughput, while continuing to work with their familiar tools.

And InterBase is so

easy to manage. It's self-tuning, and can recover automatically from system failures without the

use of log records. Add to that it's small footprint and "point-and-elick" install, and you can see why this powerful RDBMS is the ideal SQL database server for deployment throughout your enterprise.

# Fastest response in mixed read/write situations

Borland InterBase 4 is a powerful RDBMS that gives you features like multi-database joins, automatic two-phase commit, stored procedures and triggers. But the real secret to InterBase's performance is its unique versioning engine. It significantly reduces database locking by creating "difference" versions of records as they are changed. So you get the fastest response times in situations where users are both reading data from and writing to the database.

# Users and MIS both win with InterBase

This is one SQL database server that doesn't force you to make trade-offs. End users get the freedom of data access they want while continuing to use their familiar tools. MIS enjoys enhanced security and the ability to maintain the system without having to take it off-line. And everyone benefits from the increased performance. No wonder

customers like MCI and Money Store purchased more than 65,000 UNIX licenses for InterBase last year.

If you're looking to "upsize" your PC or PC network applications to client/server, call Borland today. Because Borland is the "upsizing" company.



Call today for a free videotape and technical white paper.

1-800-890-2223, ext. 8378

# **Borland**

Power made easy™

MIS
Security
Convenient system
mintenance schedule

**Everyone** wins with

InterBase 4

thigh performance with reduced locking

be a d.l., mat.or., Inc. All aghts reserved. All Borland product names are trademarks of Borland International, Inc. BI 6908

# Computer Careers

# CLIENT/SERVER TROUBLE ZONES

# by david baum

any of the new development tools on the market appear to make building client/server applications deceptively simple, but experienced developers know better. Beneath the shiny veneer lurks a number of trouble spots that can trip the unwary.

Haphazard systems administration, confusion about application partitioning and too little attention to analysis, design and database modeling issues are areas of concern. Yet some developers have found ways around these problems.

# DISTRIBUTED SYSTEMS **ADMINISTRATION**

With mainframes, there is no question about who is responsible for systems administration, data security, backup and recovery and other data center func-

But client/server environments often have no central point of control. "Client/ server involves a whole new world of maintenance," says Kipp Glover, a software engineer at Solectron, Inc. in Milpitas, Calif. "Even simple tasks such as software upgrades can become a nightmare if you don't have sufficient resources.'

For example, when a new application version is completed at Solectron, it is installed individually on each client PC a time-consuming and often confusing process.

Solectron's developers solved the problem by installing one shared drive on each of their Windows for Workgroup networks. Each client PC on the network is configured to rely on the shared drives for software updates.

"All we have to do is update one copy on each shared drive," Glover explains. "As users boot their workstations, their applications are automatically upgraded."

# **APPLICATION PARTITIONING**

Knowing how to partition application logic among client and server nodes can also be confusing for developers. Typically, database-intensive logic is placed on the server, while activities that require lots of user interaction — sorting,

querying and report writing - are placed on the client.

The problem is, once your partitioning scheme is hard-coded in this fashion, it can be very difficult to change short of a complete application rewrite.

"As the application evolves, it often must be modified to support more users, different types of processors or new functionality," says Pompi Malik, manager of information services at Brewers Retail, Inc. in Toronto. "These changes cause you to rethink the division of logic among the nodes on which that application runs."

Simple client/server applications place all application logic on the client, Malik says. Database processing is controlled by triggers or stored procedures on the server, which respond to SQL calls from the client. This is an efficient way to divide the processing load, but it generally restricts the developer to smaller applications with only 20 to 30 users.

More sophisticated client/server applications place application code on the server and the client. This makes it easier to balance the processing load as an application is scaled and lets the developer set up complex functions for multiple users. For example, the function to calculate payment of an insurance claim might reside on the server where many different insurance agents have access.

"There doesn't necessarily have to be a database involved," explains Michael Pierce, an application developer at Take Care Information Services in Aurora, Colo. "I might pass the server process bits of information that I have gathered on my window. The server takes all that and does some calculations with it and returns the results to me."

# MODELING

Many of today's rapid application building tools encourage developers to dive headlong into application construction with little thought to analysis, design or database modeling. But to minimize application maintenance over the long term, Pierce says it is better if applications can draw from a common repository where reusable information assets are defined.

Companies such as Take Care can spend months establishing an enterprise data model, but it pays off down the

"You can cross-reference your actual client/server objects from your design documentation and vice versa," Pierce says. "First you define all your data structures. Then you define all the objects that will make up each client application. It is all stored in the repository. You can point to the existing data definitions and reuse them in other applications."

This simplifies application maintenance, Pierce says, because one change to the repository can have a ripple effect throughout many applications.

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

# Advancing Careers Through Advanced Technology

Join Florida's Leader In Contracting, Training and Permanent Placement.

Now opportunities available for insourcing, outsourcing, site managers, project leaders, programmers, analysts, system administrators and software engineers.

- Tal and C with Guardian, Unix, Pathway and Tandem utilities
   Cobol/Scobol, Pathway, DDL

# **CLIENT/SERVER-OPEN SYSTEMS:**

- · Unix and C with a relational database
- Client/Server Trainers
   C/Unix with X-Windows
- C++ with OS2
- C++ with MS Windows, Windows SDK or Windows NT
- Informix, Oracle & Sybase DBA's
- PowerBuilder
- Visual Basic/Visual C

# IBM:

- Teradata & DB2 DBA's
- MVS/DB2 or MVS/IMS DB or MVS IDMS/DB P/A's with MSDOS, Unix or 0S2 exposure
- Cobol/MVS with Case Tools (IEF, ADW, PACBASE, AA Foundation)
- Application Packages (D&B or AA DCS)
   Midrange P/A's (AS400)

Tampa Bay Area 12225 28th Street North, Suite A St. Petersburg, FL 33716 800-329-2626 • FAX 813-572-1153

Jacksonville Area Freedom Commerce Centre 8375 Dix Ellis Trail, Suite 403 Jacksonville, FL 32256 800-700-3945 • FAX 904-464-0290

Orlando Area 201 S. Orange Ave., Suite 1020 Orlando, Fl 32801 800-299-9953 • Fax 407- 843-8153

Ft. Lauderdale Area 3265 Meridian Pkwy., Suite 122 Ft. Lauderdale, FL 33331 800-777-8603 • FAX 305-389-0204

# DRACS Consulting Group, Inc.

warding career opportunities with one of the fastest growing consulting firms in the Southeast. Full-time and consulting opportunities are available in our Atlanta headquarters, as well as ou Florida and Carolinas division Requirements include

> Unix, C, C++ Windows, NT, SDK Pen for Windows Mac Developer Sybase, Oracle Powerbuilder Foxpro for Windov OOP/GUI Visual Basic CNE. X.25, SNA VMS, RDB, ACMS AS400/RPG III/Cobol Application Systems Call Rating Experience

For further information, Send resume Attn: Anne Perreyclear 3343 Peachtree Rd Suite 1230-E Atlanta, GA 30326 (404) 262-1184 (404) 262-3994 fax

# It's About Time...

for a company like Cambridge Technology Partners (CTP), the professional services organization that specializes in partnering with clients to assess, structure, and implement customized information technology solutions in rapid time frames. Now, companies around the world can turn to CTP for complete client/server, open system migration strategies and implementation. Our strategies are insightful, comprehensive, and custom-designed to meet critical business needs. Find out about the information technology services company that's always ahead of its time -Cambridge Technology Partners.

CTP offers a dynamic, highenergy environment that is always exciting and clientfocused.

# **Client/Server Consulting Professionals**

This is an opportunity for highly-motivated consultants to join the leader in client/server and distributed computing solutions. Candidates must have a Bachelor's degree, excellent interpersonal and communication ability, strong application development skills, and in-depth knowledge in one or more of the

- following areas: Microsoft Windows and GUI design/development
- •UNIX, C, and/or C++
- •Oracle, Sybase, RDBMS
- Object-oriented analysis and design
- Data Modeling and physical database design/ development

#### These opportunities are available at our West, Midwest and East Coast locations.

At CTP we offer competitive salaries, progressive benefits and opportunities for professional advancement. For prompt consideration please send or fax your resume and cover letter indicating job code to Susan Loker, Human Resources, Cambridge Technology Partners, 304 Vassar Street, Cambridge, MA 02139; FAX: (617) 374-8300.

Creating Positive Energy Through Our Commitment To Equal Opportunity. M/F/D/V.



# Jon't get caugi with your pants down

Re-engineering experience may be the latest buzzword to toss around, but be careful if you use it. Hiring managers will expect you to back it up.



By Lance B. Eliot

Buzzwords come and buzzwords go, but add "re-engineering" your resume and be

prepared to explain it in detail. In fact, many information systems managers say they want candidates with process redesign know-how, but they expect proof of what it's worth.

Tony Romanus, IS support center manager at United Parcel Service, Inc. in Mahwah, N.J., looks favorably on solid reengineering skills, especially when launching or supporting new projects. For example, when hiring support specialists he looks for the ability to adapt to dramatic change. "I want someone with a fresh perspective and the business acumen to go beyond the typical set of technical skills."

When Romanus sees re-engineering experience on a resume, however, he carefully evaluates the claim. "I dig into the specific experience," he says. "I want to know exactly what role they played. I want to know that they were more than a casual observer when the overhaul took place."

#### You can't fudge it

While you can usually get away with listing a software package that you have used only once, suggesting true re-engineering experience is a different matter. "Whether a job candidate calls it reengineering or something else, I want to hear them describe how the effort impacted the business," says Michael Anzis, vice president of IS at Mazda Motor of America in Irvine, Calif. "Can they provide training on re-engineering projects? Can they articulate how to sell the project to get it accepted?" Anzis asks. "They have to prove they were actually involved in the project."

Companies often seek this experience for reasons beyond the technical issues.

"I want individuals who will serve as role models for the rest of the staff," says Larry Panatera, director of technology implementation at Pepsi-Cola Co. in Somers, N.Y. "It's useful to have IS managers and staff that can demonstrate their reengineering prowess to peers and internal customers."

Candidates hired by Panatera have been able to clearly identify how business processes were modified and improved. They could also describe the project's impact in terms of better business practices, reduced costs and other

> If you've been involved with a re-engineering project, IS managers will want the following information:



- A description of the project and its impact on the company.
- ♠ An explanation of your role in the effort.
- Ways that the experience can be applied to the current position.
- Examples of your ability to deal with change.

tangibles. "By showing the way, the experienced individual can spark others to adapt to new business processes," Panatera says.

Panatera uses experienced re-engineering staff to jump-start new projects. However, given the difficulties in finding re-engineering skills, he covets the ones he can get. But Panatera cautions that such experience does not always transfer to other projects. "Anyone who thinks you do re-engineering only one way can be a detriment as well as an asset," he warns.

# Reapplyingskills

Rather than focusing on steps in previous projects, staffers should be able to generalize beyond prior re-engineering experiences and reapply those princi-

ples to a new job.

Stuart Gaiber, IS director at Avery Dennison in Diamond Bar, Calif., has found the success of re-engineering at his company to be ample proof of the value of hiring people with this experience. "In the 1970s we looked for strong technical skills. In the 1980s we looked business functional skills. Now we look for resculpting skills."

While participation in a reengineering project can help land your next job, do not paint a false picture. Make sure you were intimately involved in the project and can sensibly apply your experi-

ences to other firms heading down the same path.

Eliot is president of Eliot & Associates, an information technology consulting firm in Huntington Beach, Calif.

WISH YOU WERE HERE? WE DO!



# Software Specialists

American Stores Company is one of the nation's largest retail grocery chains with aver \$20 billian In sales. The migration of aur Systems Develapment Center to Salt Lake City, and subsequent conversion to a Client/ Server environment with Intelligent warkstations, has created exciting career appartunities far seasaned MIS prafessianals.

We are seeking capable Software Specialists af all kinds: integrators, Analysts, Entry Level & Senior Level Systems Development Prafessianals, and Praject Leads. All positions require knawledge & experience in COBOL/MVS/CICS and VSAM (DB2, UNIX and Client/Server a plus).

In addition to an attractive compensation and benefits package, we opartunity to move to one at the country's most beautiful states and begin a new career with an established, growing campany. Ta apply, please send/FAX your resume & salary requirements with a caver letter detailing your knawledge and experi-



American Stores Company Attn: JOB#CW-0328 BOX 999 Pleasanton, CA 94566-9998 FAX: (510) 833-6497

AMERICAN STORES COMPANY

Equal Opportunity Employer.

# BRING YOUR SKILLS

# PACIFIC NORTHWEST

The Pacific Northwest offers coastal resorts, mountain ranges, reasonable cost of living, a great way of life and challenging consulting work with Computer People Inc. (CPI), an international provider of information technology solutions.

We have been providing consulting services in the Pacific NW for nearly 15 years. Our employees enjoy excellent compensation and a variety of benefits, including paid overtime. We now require experienced systems developers with 4 years business experience and any of the following skills. No entry level positions available.

IBM MAINFRAME CICS, DB2, IMS DB/DC, IDMS, ADS/O

Banking Loans, ATM, AFS, Shaw, M&I Telephony CLIENT/SERVER UNIX, MSWINDOWS SDK, C, C++ SQL/SERVER, SYBASE, ORACLE, GUI POWERBUILDER, Object-Oriented Technologies Client/Server Architecture and Design Lotus Notes, Novell, Banyan, VisualBasic

5end your resume in confidence to Computer People Inc. in the city of your choice:

# SEATTLE

Computer People Inc. ATTN: CW032194, 1601 5th Avenue, Suite 1810, Seattle, WA 98101 Suite 510, Portland, 1-800-388-2741

#### **PORTLAND** Computer People Inc. ATTN: CW032194.

707 SW Washington 5t. OR 97205 1-800-274-2707.

Fax: 503-223-1294.

Computer People

Fax: 206-628-0258

# DIRECTOR OF **INFORMATION SERVICES**

State University of New York Institute of Technology at Utica/Rome

SUNY Institute of Technology is an upper-level college emphasizing technical programs such as photonics, telecommunications, and computer science. The Institute boasts a well-equipped, attractive, modern facility on an 800-acre campus north of Utica.

The Director of Information Services oversees the institute's academic and administrative computing. These include contemporary DEC, HP, and Sun servers and workstations, microcomputers, and terminals connected to a LAN with 1000 terminal server ports and 400 Ethernet connections. Administrative computing is built around the SCT

Qualifications: Master's degree in an appropriate discipline; five or more years of experience; strong organizational, planning, communication and interpersonal skills; understanding of UNIX, MS/DOS Windows and LAN/WAN technology. Experience in an accedence environment preferred academic environment preferred.

Salary is commensurate with education and experience. Attractive fringe benefit package. Send letter of application, resume and names and addresses of three references by April 30, 1994 to:



Mr. Anthony F. Panebianco, SUNY Institute of Technology at Utica/Rome
Drawer 41012, P.O. Box 3050
Utica, New York 13504-3050 E-Mail: AAFP@SUNTIT.EDU Fax: (315) 792-7801

An Equal Opportunity / Affirmative Action Employer

Programming

# INFORMIX/UNIX **DEVELOPMENT PROFESSIONALS**

We are expanding our Systems Department and introducing a Client/ Server based Microfocus COBOL development platform. This platform will utilize an Informix database residing on a SUN server. This exciting technology presents exceptional opportunities for ambitious Development Professionals eager to play a key role in the future of one of the nation's leading fashion retailers.

#### PROGRAMMER ANALYSTS

A minimum of 2 years' expenence with COBOL and Informix required.

# **UNIX ADMINISTRATOR**

A minimum of 2 years' experience in UNIX systems administration and Informix database administration required. Solaris and AIX experience preferred.

A career with Ann Taylor offers an abundant opportunity to reach a high level of professional success. The salary and benefits offered reflect our commitment to attract and retain - the best.

Please forward your resume, including salary history, to: Ann Taylor, 142 West 57th Street, Dept. PA, 5th floor, New York, NY 10019. Fax: 212-541-3400. Only those applicants who best meet our requirements will be contacted.

# ANNTAYLOR.

Ann Taylor is an equal opportunity employer

# PICK/TOPIX **Programmers**

MVP Health Plan is one of America's fastest growing HMOs. MVP is Committed to Excellence in MIS. Our MIS Dept. supports many product lines using CSC software on a Sequoia platform. We seek professionals who have 1-5 years of PICK and/or TOPIX experience, Previous CSC Healthcare Systems experi-

MVP offers the challenge of a "start-up" backed by a history of 20% annual growth and solid financial performance. Excellent salary and benefits, including relocation assistance are part of our commitment to MIS excellence. We also pride ourselves on supportive management and a triendly and positive work environ

If you are qualified and interested in growing with MVP, please 518-370-0830



MVP Health Plan P.O. Box 2207 Schenectady, NY 12301-2207 Att: Human Resources Director

MVP is an equal opportunity employer.

# Happily, we have many jobs!

- DB2 developers
- Oracle DBA
- Oracle Data Modeller/App. Developer-
- CICS on line Sybase DBA
- C++, Windows API
- Paradox for Windows 4.5
- SAP RV, RK
- SAS/Clinical Trials

Please call or FAX resume this minute:

# **3.**ROMAC.

Vince Ciliberti, Recruiter Romac Consulting
Wayne, PA 19087 530 E. Swedesford Rd. Ph 610 687-6107

F 610 687-9456

We are building a Client/Server enterprise intended to impress our customers with its technology. We seek talented Information Systems Professionals who thrive on the dynamics of an environment where nothing is certain but change. This enterprise will be built with state-of-the-art tools



using cutting-edge computers and software. The transformation affects every employee across the company and will ultimately improve the service to customers around the world. And the system you build will be a showplace for Corporate Software for years to come.

Rule #1995: When you build a showplace, you make the rules.

# Senior Programmer/Analyst

Assume primary responsibility for completing multiple projects targeted for one or more user groups. Working with users and business systems analysts, you will design and document systems specifications for new systems development or assigned enhancements. You will also design, program, test and implement complex computer programs and complete the corresponding control language, documentation procedures and training. Requires a BA/BS or equivalent, and at least two years of programming, analysis and business applications development experience. Experience with client/server development and development tools (C, C++, Visual Basic, SQL Server and Sybase) required.

# Systems Analyst

Define, evaluate and develop systems solutions to meet the information needs of users. Assume primary responsibility for the completion of projects targeted for one or more primary user groups. Working independently, you will develop work plans for assigned enhancements and/or new systems development, including directing activities of others and scheduling multiple concurrent projects. You will consult with users and business systems analysts to define system functions and specifications to meet their business needs. You will coordinate and participate in the technical development. Requires a BA/BS or equivalent, at least three years of experience in Information Systems, proven analysis and design skills, and the ability to work unsupervised at all organizational levels. Experience with client/server development and development tools (C, C++, Visual Basic, SQL Server or Sybase) required.

# **Project Leader**

Lead major development projects and participate as a technical consultant on all systems development project teams. Plan and coordinate all aspects of assigned projects for multiple applications. You will work with users, business systems analysts and development managers to translate business information needs into system functional and technical requirements. You will also identify, evaluate and recommend technology alternatives for meeting system requirements. Requires a BA/BS or equivalent, at least five years of systems development experience, including project leadership, strong analytical skills, client/server architecture and relational database design. Experience with client/server development and development tools (C, C++, Visual Basic, SQL Server or Sybase) required.

# **Business Systems Analyst**

Sales & Customer Systems

Serve as the functional expert for all business systems requirements for one or many business units. You will consult with users to define systems needs, perform extensive business systems analysis and design throughout all development phases, and perform workflow analysis to recommend improvements. You will also work with the technical development staff to translate business needs into system design specifications. Requires a BA/ BS, at least three years of business experience, including implementation and/or use of Information Systems. Appropriate functional business experience is required, along with sharp analytical, business and written and oral communications skills.

# **Product Line Manager**

Client/Server Products

You will develop and define a comprehensive product line that delivers uniqueness to the market, value to the customer and strong revenue growth to the company. To that end, you will manage vendor relationships, identify and manage opportunities for product line enhancement and analyze and forecast market trends and potentials. You will be the driving force behind creating and implementing marketing programs. Requires at least five years' product marketing in a high tech environment, BS/BA (advanced degree preferred) and a proven track record of working closely with sales organizations to achieve sales goals. Client/server or network and communications experience is strongly preferred, along with a solid understanding of software markets and corporate account marketing.

If you have the skills and the determination to excel in a computing showplace located just off Route 128 outside of Boston, send your resume to: Human Resources, Corporate Software, 275 Dan Road, Canton, MA 02021. Fax: (617) 828-7054. We will acknowledge receipt of applications as soon as possible. Agencies may inquire after April 28. We are an equal opportunity employer.



# MIS/ LOGISTICS MANAGER

A unique, career-building opportunity with a healthy, young industry leader. Rapidly growing NYC importer of bed/bath accessories seeks microsystems/network (DOS/Novel, also MAC for product design) professional with knowledge of import logistics. Experience in style wholesaling or major retailing industry essential. Resume with salary regmnts to J. Ziebarth, Lexington Associates, box 110C, 415 E. 52nd St, NY, NY 10022-6484, or Fax to: 212-686-3593.

# Immediate need for: SAP

RV-LVS RM-MAT RM-OCS RV-RVT RM-MAIL RM/RK-INST

# **Client Server/** VAX/Unisys/IBM

- SYBASE DBA's Developers
   UNISYS-LINC II, MCP
   VAX/POWERHOUSE
- HP System Administrators TCP/IP, UNIX, CRON, C++
   HP-UNIX, ORACLE
- CICS Systems Progs (3.x)

Please Send Resumes to: Process Control Consultants, Inc., 3579 Rte 46, #6B, Parsippany, NJ 07054-1046 or FAX to: (201) 331-9551

# Consulting

Permanent

D.P. opportunities...

ORACLE FINANCIALS
AS/400
POWERBUILDER • SYBASE
ORACLE • SMALLTALK
VISUAL BASIC • LOTUS NOTES

JOSEPH CONSULTING, INC. P.O. BOX 916002 LONGWOOD, FL 32791 FAX (407) 865-9434

# EB AS/400 SENIOR TEMS PROGRAMM 'STEMS

We are a medium size, rapidly growing, nationally recognized manufacturer and distributor located in Northern New Jersey. We are seeking an experienced Systems Programmer to oversee our MIS activities

We are seeking a hands-on technical manager with 7-10 years MIS experience, including a position with a manufacturer or distributor in an AS400 environment. Skill in RPG/400, LAN's, and Windows is required, as well as previous project management experience in the implementation of an MRPII system. Experience in managing others is required.

Responsibilities include programming, systems integration, application package selection, determining user requirements, operations, and staff scheduling. We offer a competitive salary and benefits, including 401K. Please reply in confidence with detri an recurre and male years to ry to: CW-127282, Computerworld, Box 9171, ramingham MA 01701-9171.

Communications Software Engineer III. Requires: Master's Degree in Information or Computer Science and 3 years experience in Computer Science and 3 years experience in Software and Software on Software and Software on Software English Software En Science and 3 years experience in software engineering or systems analysis. Experience must include 2 years in MS-Windows, SDK, X-Window, and Silicon Graphic programming, 2 years in programming using Intel 8088/8086, C++, and Motorola 68040 assembly languages, 1 year programming with artificial intelligence (hierarchical reasoning, learning and robotics) and image processing [image understanding environment (IUE) user interface, image compressing, histogram, edge extraction, image storage, and image warping), including computer vision (making computers perform uman perceptual analysis for extracting environmental and symptics in the second of the secon human perceptual analysis for extracting environmental and symbolic information from Images), 1 year experience programming within Sybase SQL database and server, and 2 years experience with communications programming, including network protocols (TCP/IP, LAT, Extracts, and Token Ring), file transfer protocols (Z modem, Y modem, and C Serve B+), and terminal emulation for DEC VT, ANSI, and IBM 3101. Duties: Design, develop, and maintain Remote Portable Office ("RPO") for Remote Access Division ("RAD") through Integrating existing system resources such as SQL databases and servers, personal computers, mainframes. existing system resources such as SQL databases and servers, personal computers, mainframes, printers, telephones, moderns, local area networks; design, develop and enhance existing software products by adding terminal emulations, call logs for the SQL database, image viewers, character recognition from raw photo Images, and support for supplemental network protocols, such as Apple Talk Transaction Protocol; expand/enhance learning capability of software through user-interface related software linking computers using Borland C++, 8086/8088 Assembly, SDK, DDK, and "C" languages in MS-Windows environment and SQL Database for IBM PC compatible, Macintosh, SUN, and VAX equipment. Position is in Atlanta, GA area. EOE. 40 hrs/wk; 8:00 a.m. to 5:00 p.m. salary: \$47,000/yr. Send resume (NO CALLS) to David Brookmire, Vice-President-Hurnan Resources, Digital Communications Associates, Inc., 1000 Alderman Drive, Alpharetta, Georgia 30202-4199.

# IMMEDIATE CONSULTING **OPPORTUNITIES NATIONWIDE**

CAPRICORN SYSTEMS INC. offers exciting opportuni-ties for exceptional individuals

- PEOPLE SOFT/CLIENT
- SERVER SYBASE/POWERBUILDER
- · MS WINDOWS/VISUAL BASIC
- · ORACLE 7.0/FORMS 4.0/
- CASE
- AS400/RPG/COBOL/SYNON
- VAX/RDB/C/COBOL/ACMS · VAX/CELLULAR BILLING
- We offer excellent compensation

package and relocation expenses. CAPRICORN SYSTEMS, INC

Dunwoody Park, # 109 Atlanta, GA 30338 Fax: 404-399-7789 Phone; 404-399-6789

# **SENIOR BUSINESS** SYSTEMS ANALYST

This preeminent provider of facilities management services is seeking a Senior Business Systems Analyst with experience in planning, development, maintenance, and operating of work control systems including: work order management; service order management; job estimating; preventive maintenance management and scheduling; and inventory, supply, and purchasing.

Technical experience preferred in programming/analysis of COBOL and C; RDBMS experience in progress, and other quality RDBMSs such as ORACLE, GUPTA SQL and SYBASE. Technical platform experience in NOVEL LAN environment and development of GUI systems a plus.

Responsibilities will include systems planning, requirements definitions, systems development, integration, and maintenance. Also included will be the support of several remote project sites, and start-up support for new projects, requiring some travel. Ability to work as a self-starter in team environment required.

Qualified individuals should send their resumes with salary requirements to: Attn: S. Coburn/SBSA, Johnson Controls World Services Inc., 7315 No. Atlantic Ave., Cape Canaveral, FL. 32920.



We Promote A Drug Free Work Environment Women, Minorities and The Disabled Are Encouraged To Apply Equal Opportunity Employer.

# TICIPA

# 100's Of Jobs!

- O Engineering (H/W & S/W)
- Manufacturing
- O Programmer/Analysts Tuesday & Wednesday
- O IS/MIS
- O Marketing/Sales
- O Customer Support & Training

#### Over 35 companies, including:

- Fidelity InvestmentsCSC Consulting
- Epoch Systems
- The Vonguord GroupFirst Doto Corp.
- Kronos
- Visto Microsystems
- Andersen Consulting
- Kendo Systems

# course of oction that WILL get results -

April 12 & 13

3:00 - 7:30 pm

Hillcrest Conference Center

220 Bear Hill Rd.

Waltham, MA

Directions: From Rt. 128 South: take exit 278 & follow signs to Second

Ave./Bear Hill Rd.
From Rt. 128 North: take exit 278, take first 2 rights & follow signs to Second Ave./Bear Hill Rd.
Hillcrest is opprox. 1 mile on right.

Powersoft

employers.

You want to be where the jobs

are. You want to get noticed. Plan o

be at the Target

Career Fairl

- Sun Microsystems/Boston The Foxboro Company

All participating companies

ore equal oppartunity

- SotCon Technology
- Edgewoter Technology
- Combridge Technology
- Motorolo Semi DRT Systems
- Computer Tosk Group

**Targe** Career Fairs For more information about

Target Career Fairs, call our toll-free number at (800) 906-0084

#### DP STAFFING SINCE 1969 PERMANENT FL OPPTYS DBA's Sybase .... \$50K DBA Oracle AIX.... Proj Ldr C++ X-WIN..... \$65K P/As Powerbuilder...... \$60 K DBA PROGRESS/AIX...... \$50 K P As DB2 IMS CICS ...... \$42 K

P.As UNIX Client Server. \$50K P.A C++ Windows SDK ..... \$50K P.A's UNIX C Sybase..... \$48K P/A UNIX C Informix..... \$44K S'A IEF MVS'OS2..... \$50 K

AVAILABILITY INC Dept. G.P.O. Box 25434 Tampa Florida 33622 813 286 8600 FAX 8 3 20 - 0574

\$42K

Consultant, Software Develop ment: Design commercial applica-tion & communication software; provide on-site maintenance supprovide on-site maintenance sup-port to customer including debug-ging, modifications, fine tuning & code optimization; design & de-velop applications for credit card processing, inventory & materials management, loan processing, personnel & payroll accounts; prepare technical reports & user manuals; oversee installation of systems; work extensively in manuals; oversee installation of systems; work extensively in UNIX & MS-DOS environments with IBM AS/400, OS/400, Tandem/Guardian database & platforms with Cobol, RPG, C, IEW, & TACI. software products & languages; \$41,683/yr. M-F, 40 hrs/wk. BSCS or equivalent B.S. in Computer Sc. or Computer Eng. & 2 yrs. exp. In job offered or as Systems Analyst or Programmer Analyst. Background must include software development, & systems design & database access techniques & use of CO-BOL, C, RPG, AS/400 & IBM database platforms. Submit resume to Job Service of FL, 3421 Lawton Rd., Orlando, FL 32803-2999, RE: Job Order # FL-0986402.

# SOUTHEAST

Join Computer Consulting Group, one of the Southeast's most dynamic consulting firms, and watch your career soar. We are seeking talented and motivated programmer/analysts and have Immediate staff openings through our offices in Richmond, VA, Raleigh and Charlotte, NC; Greenville and Columbia, SC. Our immediate and continuing needs are

- · CICS &/or IMS/COBOL

- SYBASE
- WANG/PACE POWERBUILDER/
- FoxPro/Windows PC/MAC Support
- Specialist
   AS-400/RPG
   UNISYS/MAPPER
- · IMS/DB-2/APS · Visual Basic/MS Access

· ORACLE/UNIX/C CCG offers competitive salaries, attractive benefits, relocation assistance and MORE! For immediate consideration send resume or call NOW!

# Computer Consulting Group

Contract Professional Services

One Monckton Boulevard Columbia, SC 29206 1-800-222-1273 • FAX (800) 539-3339 Member NACCB

# Senior Programmers-**Technical Analysts**

# **Product Development PC Based Systems**

Computer Power, Inc., America's innovation leader in mortgage and financial automation, has immediate opportunities for Senior PC Developers for its new state-of-the-art mortgage loan systems.

These senior level positions require 3-5 years' experience in PC programming using C, COBOL, C++, Visual Basic, Visual C++, Smalltalk, Powerbuilder or other 4th generation tools for PC platforms. The functionality being developed includes communications, networking, billing, store/forward messaging, and Windows graphical user interfaces (GUI) for new application development, and for the reengineering of several existing products. This new development will revolutionize the way mortgages are originated processed and packaged for sale revolutionize the way mortgages are originated, processed, and packaged for sale in the United States.

Senior Programmers

The individuals we seek for these openings will become part of a project team using the latest tools and technology. Strong experience in Visual Basic or Visual C++, and exposure to databases and object-oriented development technology. niques will identify the most appropriate candidates.

Technical Analysts

The Technical Analysts chosen will follow CPI's Systems Development Methodology working as part of a development project team. Their responsibility will be to define the technical aspects and programming requirements of the various projects, and participate in testing. Must take advantage of the tools used and consider operational efficiencies of the components used in the development. Must be able to document their work, present and close projects, and have the ability to communicate to technical and management personnel. Must have exposure to the same tools required for the Senior Programmers. The ideal candidate will have a strong programming background and business application development experience as well as knowledge of networks, communications and databases.

For immediate consideration, please fax your resume and salary history to Cathy Welch, Human Resources, Computer Power, Inc., 661 Riverside Avenue,

Jacksonville, FL 32204-2987. Fax:904-356-7467.



COMPUTER POWER, INC. The Power Of Experience.

No Phone Calls Please Equal Opportunity Employer M/F/V/H

# We're expanding our Sales Force.



Due to unprecedented growth as the trendsetter in the industry standard of client/server architecture, SYBASE is actively seeking to hire technical sales pro-fessionals in the following locations: New York, New Jersey, Boston, Burlington, Bethesda, Atlanta, Tampa, Cincinnati, Chicago, Cleveland, Philadelphia, Char-lotte, Detroit and Minneapolis.

Systems Consultants

Responsibilities:

- Technically qualify and help close sales opportunities
  Deliver pre-sales technical support

Requirements:

- At least five years experience in a sales or application development environment A working knowledge of UNIX, PCs,
- networking, programming languages, GUI tools and 4GL relational databases Experience doing customer presentations and troubleshooting

Sales Representatives

- Responsibilities: Market and sell the full range of SYBASE products and professional
- services
- Develop new business Travel to customer sites in order to assess problems and needs
- Conduct sales presentations

# Requirements:

- Five years experience in selling solution software
- Proven track record of overachievement of quota
- Strong technical aptitude Excellent organizational and
- presentation skills

#### **District Technical Managers** Responsibilities:

- Manage systems consultants
- Work with district sales managers in developing new business

- Travel to customer sites in order to assess problems and needs
- Conduct seminars and sales presentations

# Requirements:

- Five years experience in technical management
- Proven performance in a database sales environment Strong technical background and
- education Excellent organizational and presentation skills

#### Telesales - Account Executives Responsibilities:

- Inside sales of the SYBASE RDBMS Selling through direct and alternate channels to the Commercial and
- Federal sector Manage information provided through marketing information systems and

#### programs Requirements:

- Minimum of 2 years software sales experience
- Knowledge of RDBMS, tools, UNIX, and/or NLM products
- A track record of overachievement of quota for at least four years

SYBASE offers an excellent compensation plan as well as a comprehensive, cafeteria-style benefits package. Please mail or fax your resume indicating position and location of interest to: SYBASE, 6550 Rock Spring Drive, Bethesda, MD 20817, Attn: Cindy Roemer, FAX: (301) 897-1605. Principals only, please. Equal Opportunity/ Affirmative Action Employer.



The Enterprise Client/Server Company™

data processing

#### **WE WANT YOU**

We will hire talented, seasoned (3 years+) IS Professionals to meet the needs of our expand-ing client base in:

- THE CAROLINAS
  -PowerBuilder, Sybase or
  Oracle or Visual Basic
  -Natural 2.1, Adabes,
  TSO/ISPF
- TSO/ISPT VAX Fortran, Ingres or Oracle,

- 4GL

  C, Ingress, SOL., SMF,
  MicroVax VMS

  Cobol, ClCS, DL/1, IMS, MVS,
  DOS/VSE

  Cobol II, MF Cobol, TSO,
  ClCS, Easytheve, Assembler
  DB2, VSAM, Endevor, JCL

  Cobol, VSAM, ICCF,
  DOS/VSE
- AS/400 RPG, Cobol
  JD Edwards Calls or MacPac
  PC Software Installs

- EAST TENNESSEE
   PL/1, CiCS, DB2 or IMS
   PL/1, TSO/ISPF
   SAS, TSO/ISPF
   UNIX Oracle (FORMS, REPORTWRITER)
   Cobol, CICS, DB2, MSA
  Systems & nabes
- Systems Analyst Walker, Walker Tools

- NORTH FLORIDA
   PowerBuilder, Sybase or Visual Bask: XGEN, CANDE, WFL, DMSII, COMS
- We offer competitive salaries, full benefits, relocation and educational assistance to qualified candidates. Call or send resume to:



AMERICAN COMPUTER PROFESSIONALS Dept. CW-328 140 Stoneridge Drive Suite 350 Columbia, SC 29210 800-933-9227 FAX: 803-779-1955 equal opportunity employer

Applications Development Engineer. Must have BS in Comp Sci, Eng or Math w/ 2 yrs exp in job or 2 yrs exp developing computer systems for business applications. Must be proficient in: systems analysis and design using GRACLE, C, SQL, UNIX, Case Tools and VAX platforms. Must be willing to relocate throughout US for varying periods of time. Will provide applications development a software engineering services in house or at client locations to customers in the industrial, manufacturing, retail, & computer s/ ware/h/ware industries; utilize & apply knowledge of computer & engineering principles in design & development of appropriate applications to support client accounts such as production & manufacturing planning, inventory & materials schedules; determine engineering requirements & recommend appropriate software & operating systems to accommodate integrated manufacturing/production information; install new systems, conform electrical circuits to systems requirements; develop, implement & test applications using knowledge of ORACLE, C, SQL, UNIX & Case Tools on VAX platforms. Salary \$42,000 per yr. 40 hpw. Several positions available. Apply in Person or By Resume To: GA Dept of Labor, 1535 Attinson Road, Lawrenceville, Georgia 30243 or nearest GA Job Service Center. Refer to Control #'GA 5706775.

PERMANENT POSITION, SENIOR PROGRAMMER ANALYST - Work in a highly talented group environment to assist with responsibility according to customer satisfaction issues with design, development, implementation and problem solving relating to the implementation of high performance on-line transaction propossing systems involved. action processing systems involv-ing host and embedded software systems for the lottery industry. REQUIREMENTS: Master's of Scisystems for the lottery industry. REQUIREMENTS: Master's of Science Degree in Electrical Engineering or Computer Science. Must have excellent programming skills in "C", Fortran, Assembler; Strong knowledge in DOS and VAX/VMS. Must have demonstrated experience with design and implementation as well as troubleshooting and problem solving skills. Experience with operation of Concurrent Computer mainframe systems and Z80 and 68000 microprocessing for embedded applications required. Must be willing to travel 30% throughout the U.S. Must be willing to carry a beeper for 24 hours/s to be on call for customer sup xt. HOURS: 8:30 A.M. - 5:30 P.M. RATE OF PAY: \$36,000.00. SEND RESUME TO: R.I. Job Service, 101 Friendship Street, Providence, R.I. 02903, Case No. 209, Attn: T. Salabert.

Price Waterhouse, one of the nation's premier management consulting firms, is seeking highly motivated professionals to join our Southeast Management Consulting Practice. Positions are available in our Atlanta, Baltimore, Charlotte, Falls Church, Philadelphia, Tampa offices.

# **Imaging**

We are looking for people with hands-on development experience with imaging systems. Knowledge of Informix/Plexus/Floware systems is strongly preferred although other technologies will be considered. Development is done primarily using C. Additional experience with EHLLAPI is a plus. Positions are available for Staff and Senior Consultants. The successful andidates will have 2 to 6 years of application development experience.

# Communications/Systems Administration

We are also looking for an individual with significant experience designing, installing and administering sophisticated, multi-site networks in a client server environment. Experience with UNIX, Solaris, TCP/IP and/or Ethernet is strongly desired. We are looking for a Senior Consultant or a Manager with 5 to 8 years of experience.

# Sybase/PowerBuilder

We have several openings for individuals with 2 to 6 years of experience developing Sybase/PowerBuilder applications. These are also for Staff and Senior Consultant positions.

We are looking for Staff and Senior Consultants with 2 to 6 years of development experience with Oracle. We need individuals skilled in custom development or package implementation. On the package side, experience with financial manufacturing and/or distribution modules is desired.

# Systems Re-engineering

In this area we are looking for Senior Consultants that have re-engineered mainframe systems into leading edge technologies (preferably Client Server). Use of CASE tools, IEF preferred, and structured methodology are highly desired.

We are also looking for a Manager with strong CASE Tool experience (preferably IEF) to join our practice. This individual will be responsible for leading systems development projects, and selling our services to existing and new clients.

All of these positions require exceptional communication skills, strong analytical abilities, a Bachelor's degree, and the ability to work as part of a team in a high-profile, professional environment. Prior consulting experience is a plus. Must be willing to travel extensively. Price Waterhouse offers exceptional career advancement opportunities as well as strong benefits and training programs. We are committed to providing the best consulting services to our clients and the best development opportunities for our staff. As your career progresses so will your skills. For consideration for any of these openings, please send your resume and cover letter to: Price Waterhouse, Department A, NationsBank Corporate, Center, Suite 5400, Charlotte, North Carolina 28202. Price Waterhouse is an equal opportunity employer. No third parties at this time.

Price Waterhouse



# VISUAL BASIC/ CLIENT SERVER



**Programmer Analyst** Sr. Systems Analyst **Systems Analyst** 

Georgia-Pacific is a Fortune 40 Company and worldwide leader in the forest products industry. We have several exciting career opportunities for talented professionals to help lead us into 21st century data processing in support of our worldwide operations.

 Design
 Code
 Test Program & Implement
 System Design Testing • Project Leadership

• SQL Server • Visual Basic • MS Suite Client Server • DOS/Windows

Georgia-Pacific offers competitive salaries and comprehensive benefits package. For consideration, please send resume (which must include salary history) to: Georgia-Pacific Corporation, Corporate Staffing, Department Code GE002, P.O. Box 105605, Atlanta, Georgia 30348-5605. An equal opportunity employer m/f/d/v. Due to the volume of response we are unable to respond to all inquiries.

Georgia-Pacific 🚓



# DunsGate is Your **Gateway** to **Emerging Technologies.**

We are DunsGate, a division of Dun & Bradstreet. Our mission is to work in the application of emerging technologies in order to create new systems that give our customers faster, easier and more effective worldwide access to information and services.

Do you want to work in a fast paced environment with a hands-on approach to projects where both individual expertise and teamwork are highly valued? Do you seek challenging assignments in an innovative, highly creative work atmosphere? If so, we currently have openings in our development environment:

# Sr. Development Specialist 6+ years exp.

# **Development Specialist** 2 - 5 years exp.

- PC Development Experience
- CProgramming
- OS/2, PC-DOS, NetBIOS

As a member of a project team, you will take responsibility for design, enhancement and implementation of advanced gateway applications.

Prerequisites include experience in innovative business applications development, strong communication skills, a team attitude, self-motivation and a college degree.

We offer the type of benefits expected of a global leader, including comprehensive medical and dental plan; life, disability, and travel insurance; profit participation and retirement plans. Additionally, we provide comprehensive inhouse development workshops as well as tuition reimbursement.

Interested candidates should forward their resumes, which must include salary history, to:

# **DunsGate**

Human Resources Dept. CW394 711 Third Avenue, 16th Floor, New York, NY 10017 Fax: (212) 949-3996

Internet: RECRUIT1@DGATE.DGT1.COM

An Equal Opportunity Employer M/F/D/V No agencies please.

# DunsGate

a company of The Dun & Bradstreet Corporation

# **EXPERIENCED** CONSULTANTS ALC/BAL COBOL II - DB2 IMS DB/DC - CICS

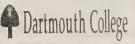
FULL TIME or HOURLY CRA, one of Central CRA, one of Central
Pennsylvania's leading
consulting firms, has
Immediate needs
throughout the Central
Pennsylvania and
Mid-Atlantic areas for
IS professionals with at
least 2 years
experience.
CALL/FAX TODAY!
Computer Resource
Associates, Inc.
3314 Market Street, Suite 201
(717) 737-4810
FAX (717) 975-0676
EOE

# ADMINISTRATIVE COMPUTING

Senior Programmer/Analyst

Dartmouth College seeks to hire a Senior Programmer/ Analyst to work with our Student Information Systems Team. Preference given to applicants with ORACLE DBMS programming experience. Will consider applicants who can demonstrate experience with other DBMS. Experience in the design and development of complex systems required. Experience with VAX/VMS, Macintosh or student systems is a rule. Position will involve some use of 3CL languages on a plus. Position will involve some use of 3GL languages on legacy systems. Bachelor's degree with 6 years of related administrative systems experience; or the equivalent. The review of applications will begin on April 15, 1994 and will continue until the position is filled. Please submit resume, approximate salary requirements and the names and teleone numbers of three references to: Phillip Hobbie, Project Manager, Administrative Computing, 6209 Clement Hall, Dartmouth College, Hanover, NH 03755-3574.

An Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply



# PROGRAMMER/ **ANALYSTS**

(PERMANENT/CONTRACT)

Tampa/St. Pets, Orlando, Jacksonville South Florida

AS/400, POWERBUILDER. X-WINDOWS, VISUAL BASIC, TANDEM, DCS, DB2, Many other req.

> Information Systems Group 305/389-3196 (fax)

# MAPPER **PROGRAMMERS**

MAPPER specialists are needed to provide analysis, design, programming and user support for large social service development efforts. These positions require a background in MAPPER RUN DESIGN and a minimum of 3+ years DP. Work entails data manipulation and conversions of large reporting systems. DTM knowledge a plus. Excellent customer stills required. customer skills required.

PINKERTON is an employee-owned company in business since 1967. Excellent company paid benefits available for full-time employees with Consultants welcome to apply. For more information, please call George Jensen at (804) 288-1822 and/or fax/send resume with salary requirements to: 1501 Santa Rosa Rd. #B3, Richmond VA 23288 Fax: (804) 288-9130

> **PINKERTON COMPUTER** CONSULTANTS, INC.

# **CLIENT/SERVER**

METRO, a leading information technology consulting services company with a Staff of 800 professionals in 16 locations, is experiencing phenomenal growth.. much of it in the Client/Server arena.

If you see yourself at the forefront of your profession, appreciate the challenge of consulting, and recognize the value of technical and professional skills in providing Clients with "Service beyond their expectations," we may have an opportunity for you.

We are seeking Software Engineers and Database Analysts with 3 or more vears' experience in:

Sybase PowerBuilder Visual Basic FoxPro

METRO IS PEOPL

2

• METRO

Access Informix 4th Dimension malltalk C. C++

Windows NT UNIX Omnis 7 Oracle

METRO

S

• METRO IS

PEOPLE • METRO IS PEOPLE

Opportunities are available in all locations

Richmond, Roanoke, and Virginia Beach, VA; Charlotte, Greensboro, and Raleigh, NC; Nashville, TN; Greenville, SC; Atlanta, GA; Ft. Lauderdale, Jacksonville, Orlando, and Tampa, FL; San Juan, Puerto Rico; Dallas and Houston, TX.

For immediate consideration, please forward (or fax 804/486-0816) your resume to: Kim Wooldridge, Dept. 494, METRO Information Services, Corporate Headquarters, P.O. Box 8888, Virginia Beach, VA 23450. EOE

Information Services

# CLIENT/SERVER SPECIALISTS

Growth creates Client/Server Application
Development opportunities with ANATEC in Houston,
Detroit, Minneapolis/St. Paul and Indianapolis.

As one of the fastest growing and most experienced Client/Server systems integration companies, ANATEC is a leader in implementing solutions for Fortune 500 companies based on Client/Server architectures, RDBMS and 4GL's.

New development has opened exciting, state-ofthe-art opportunities for Client/Server Specialists. Positions are available for Software Architects, Analysts and Developers in the following areas:

\* SYBASE \* Powerbuilder \* ORACLE \* UNIX \* C/C++ \* VISUAL BASIC

# **SYBASE PROFESSIONALS**

We have opportunities for experienced SYBASE Application Developers and DBA's who want to gain access to the SYBASE "STEP" program and work with the latest technology including System 10.

Exceptional salary/benefits. Please forward resume

in confidence to: ANATEC, Attn: Michelle Tyree, National Staffing Mngr., 4801 Woodway Dr., Ste. 300 East, Houston, TX 77056, FAX: (713) 964-2721. EOE.



Analytical Technologies, Inc. The Transitional Systems Integration com

# MOTIVATION WILL GET YOU **EVERYWHERE** AT CPI.

If you're flexible, a team player, and highly motivated, there's no telling how far you can go with industry-leading Computer Power, Inc. - America's largest provider of mortgage and financial auto-

# Data Administrator

You'll work with organizationwide users to determine business functions and data needs, translate them into logical process and detailed

business/data models, and ensure enforcement of corporate data standards. Requires a Computer Science degree (or equivalent experience), familiarity with Structured Analysis and Design, Information Engineering, Object Oriented Analysis and upper CASE tools, plus 5 years of experience as a business analyst or programmer including at least 2 years as a data adminis-

So, if strong company stability, challenging work and terrific compensation and benefits appeal to you, get the kind of recognition you deserve. Send your resume to Cathy Welch, Human Resources, Computer Power, Inc., 661 Riverside Avenue, Jacksonville, FL 32204-2987. Fax: 904-356-7467.

No Phone Calls Please Equal Opportunity Employer M/F/V/H



COMPUTER POWER, INC. The Power of Experience.

How to find the Southeast's top computer talent.



1-800-343-6474

Software Development Engineer - Represent company in developing proprietary software used for disability & accident benefits tracking systems; utilize & apply computer knowledge & mathematical principles in design & development of appropriate applications to support client needs; develop algorithms for graphics, image processing, and visualization; analyze client business operations & recommend appropriate computer systems to accomodate company accounts; formulate project specifications, develop user training programs. oversee systems design, programming, testing and integration of new software; work extensively with UNIX systems, ADS Oracle front-end fourth-generation language, SQL\*Forms, SQL\*Plus, C, & SQL\*Report Writer. \$38,400.00/yr. 40 hrs/ wk. BSCS or equivalent degree in CS, Math, or Computer Eng. & 2 yrs. exp. OR MSCS & 1 yr. exp. Background must include systems design, development & installation using ORACLE, SQL\*REPORT WRITER, ADS, UNIX systems, & C language, SQL\*REPORT WRITER, ADS

# Computerworld recruitment advertising works!

 ${f T}$ hat's because more computer professionals read more recruitment advertisements in Computer-world than in any other newspaper.

For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

# Computer Consultants MULTIPLE ONE YEAR+ ASSIGNMENTS

Sign-On

Bonus

ADEPT, Inc. has many contracts that are a minimum of one year in duration starting between now and August 1st, 1994. If you have one or more of the following skill sets, contact us immediately. The client is interviewing now for future positions. <u>ALL</u> skills listed require multiple professionals. Call us today!

o CICS. VSAM. COBOL o COBOL, VSAM

O TANDEM, TAL **LOTUS NOTES** 

o Easytrieve Plus

ORACLE or SYBASE OD&B or MSA - GL

○ INFORMIX IV - GL o VAX, VMS, C

O VAX, VMS, RDB, COBOL or FOCUS O POWERBUILDER, SQL/Server

o Proj. Mgrs. or Bus/Syst Analyst w Banking systems exp.

FAX (617) 237-0892. Internet adept@world.std.com Member NACC8/ECE. Permanent Positions are elso Aveilable

Phone (800) 66-ADEPT, (617) 239-1700,

We offer group health insurance, 401K and

ection 125 plans and lucrative bonus plans.

ADEPT, Inc., 888 Worcester Road,

Wellesley, MA 02181

RUSH your resume via mail or FAX to: Kirsten Nelson, Technical Recruiter

The Absolute Alternative in Information

# Computerworld recruitment advertising works!

That's because more comprofessionals puter more recruitment advertisements in Computerworld than in any other newspaper.

For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

> Weekly. Regional. National. And it works.

An IDG Communications Publication

\* AGS \* AIC \* AMGEN \* AT&T \* Arizona Department of Transportation . Abacus Consultants . Adept . Aerotek . Aetna . Alamo Rent-A-Car \* Alaska Airlines \* Alco Health Services . Aldus . Allied Signal . Amdahl . American Management Systems \* American Airlines . American Cyanamid . American Express . America Heart Association . American List Council \* American Red Cross \* Ameritech Information Systems . Amway . Anatec . Andersen Consulting \* Apple Computer \* Atlante High Tech Cereer Fair . Ball State University . Bank of America . Barnett Technologies Baxter Healthcare \* Bell South \* Bentley College \* Blue Cross/Blue Shield \* Booz Allen Hamilton \* Brannon & Tully \* Bridgestone Software \* Broadway & Seymour \* Brown Brothers Harriman \* Broyhill Furniture \* CAP Gemini America . CPU . CSC Partners . Computer Task Group \* Capricom Systems \* Career Fair Coordinators \* Carolina Power & Light \* Cellular One . Central Maine Power . Charles Schwab \* Chicago Board of Trade \* Ciber \* Circuit City \* Citicorp \* Claremont Consulting \* Coca-Cola \* Comdisco \* Computer Horizons \* Computerworld \* Compuware \* Coopers & Lybrand \* Coors Brewing \* Covia/United Airlines Cray Research • D&B Software • DHL • Deloitte & Touche . Digital . Dow Jones . Dun & Bradstreet \* E-Systems \* EDS \* ESPN \* Eckerd Drug . Eddie Bauer . Eli Lilly . Emery Worldwide \* Equifax \* Ernst & Young \* Esprit Systems • Executive Life • Federal Express • Federal Reserve Bank \* Fidelity Investments \* First Chicago \* Florida Power & Light \* G Heileman Brewing \* GE Consulting \* GLAXO \* GTE Gallo Winery • Gartner Group • General Mills Gulfstream Aerospace
 HBO
 Harris Hayes Microcomputer . Heidrick & Struggles . Hewlett-Packard . Hill & Knowlton . Holiday Inn Hyatt Technical Center \* IBM \* Informix \* Ingres \* Intel \* Interactive Business Systems \* Intergraph \* Interleaf \* Internet \* Intuit \* Johnson Controls \* Kaiser Permanente Keane • Kemper • Knowledgeware • Legent • Logica • Lotus • MIT • Marriott • Mastercard International . Maybelline . Melita . Mellon Bank . Memorex . Metropolitan Life . Micro-Focus • Microsoft • Morgan Stanley • Nationsbank . National Computer Associates . National Education Training Group . Nellie Mae . Nestle • Nike • Nissan • Northern Trust • Northrop \* Novell \* Oracle \* Packard-Bell \* Perot Systems \* Powersoft \* Price Waterhouse Primerica \* QVC Network \* RRA Rohn Ragers Consulting \* Racal Milgo \* Reader's Digest \* Reed Reference Publishing \* Reuters \* Reynolds Metals \* Riyad Bank \* Roadway \* Robert Half International . Rubbermaid . Šafeco . Sears Technology Services • Sequent • Service Merchandise . Siemens . Silicon Graphics Software 2000 \* Software AG \* Sony \* Southwest Airlines \* Sprint \* Staples \* Sterling Software • Storagetek • Sun Microsystems • Sunkist Growers \* Swiss Bank \* Sybase Synon Systemhouse \* TASC \* TRW \* Tandem \* The Limited \* The Los Angeles Times \* The Registry \* Timberland \* Toshiba \* Toyota \* Tufts Health Plans \* Tupperware \* UNISYS \* US Air • US Robotics • ÚSAA • United Airlines United Parcel Service • Upjohn • Vanguard • Viacom . Virginia Lottery . Walt Disney World Wang Laboratories
 Warner Bros
 Waste Management \* Wells Fargo Bank \* WordPerfect \* AGS \* AIC \* AMGEN \* AT&T \* Arizona Department of Transportation . Abacus Consultants \* Adept \* Aerotek \* Aetna \* Alamo Rent-A-Car . Alaska Airlines . Alco Health Services \* Aldus \* Allied Signal \* Amdahl \* American Management Systems • American Airlines \* American Cyanamid \* American Express • America Heart Association • American List Council . American Red Cross . Ameritech Information Systems \* Amway \* Anatec \* Andersen Consulting . Apple Computer . Atlanta High Tech Career Fair \* Ball State University . Bank of America . Barnett Technologies · Baxter Healthcare · Bell South · Bentley College . Blue Cross Blue Shield . Booz Allen Hamilton • Brannon & Tully • Bridgestone Software . Broadway & Seymour . Brown Brothers

America's Leading Corporations Advertise Their IS Positions in Computerworld. Shouldn't You?

# COMSYS-

# Great Plans, Great Opportunities.

COMSYS Technical Services, a progressive national computer consulting organization, has dynamic opportunities available on state-ofthe-art projects at our Branch Office locations throughout the U.S. Openings exist for professionals with the following expertise:

# <u>CLIENT/SERVER</u>

- •SYBASE/ORACLE
- GUI/PowerBuilder •SMALLTALK/V or 80

# <u>APPLICATIONS</u>

- •OS/2 PM EASEL COBOLII DB2 CICS
- C UNIX RDB+ JYACC JAM

# M/F DATABASES

- ADABAS/NATURAL •IMS DB/DC DB2
- •IMS DBA

# SYSTEMS/COMM

- HPUX SYSTEMS or APP
- •SS7 PCN RF • X.25
- •M/F SYSTEM PROG

# <u>MISCELLANEOUS</u>

- UNIFACE •TPF PARS
- VISUAL BASIC
- UNIX SVR 4 Tier III Spt

We offer competitive compensation and benefits. Please send resume to: COMSYS Technical Services, Attn: NTL Dept. CW-0328, P.O. Box 7947, Gaithersburg, MD 20898-7947. FAX: (301) 921-3700.

Call our Branch Offices: Atlanta, 800-562-7882; Colo. Spgs, CO 800-288-2667; Denver, 800-234-9454; Dallas, 800-653-7636; Phoenix, 800-726-6797; Washington, DC 800-926-6797. EOE/M/F/D/V



International Software Designs is a fast-growing, internationally active software consulting, systems integration and client/server-based banking products firm located in Los Angeles, CA. ISD's clients for products and systems integration include a select group of Fortune 500 companies and banking institutions.

ISD has positions available for

# Sr. Systems Analysts and Programmers

- 3 5 years experience with distributed computing or Client/Server systems and any of: Oracle, Sybase, DB2, Windows, WindowsNT, Access, Visual Basic, UNIX, Powerbuilder, Smalltalk and Macintosh-based systems applications programmers.
- Strong experience with client/server systems in banking (lending or branch automation) and manufacturing applications.

If you're Interested in a career in software development, ISD pays a competitive salary commensurate with experience and provides a complete medical benefit package. Assignments are mostly in So. Cal. ISD is an Equal Opportunity Employer. Interested candidates should send or fax their resumes to: Attn: Professional Services Recruiter, International Software Designs, 200 Corporate Pointe, Suite 460, Culver City, CA 90230. Fax: (310) 670-3156.



# PeopleSoft. Run with us.

Hundreds of companies worldwide run with PeopleSoft, the leader in client/server business software. If you're one of those people who needs a fresh challenge, consider running with our team. At PeopleSoft, we reward innovation, creativity, and plain hard work. Run with us as we continue to build, sell, and service the best business software in the industry.



# Financials Developers

Join one of our first-rate financials development teams and enjoy a progressive development environment that encourages your creative individualism, self-managing style, and worship of the team dynamic. We have openings now in these groups at our corporate headquarters in Walnut Creek, California: general ledger, asset management, accounts payable, inventory, and purchasing. As a member of one of our leading-edge client/server development teams, you'll participate in all aspects of the product development life cycle including functional analysis, database design, application building, and testing.

You should have some strengths and expertise in these areas: graphical application building tools, SQL, a relational database mindset, 4GL report writers, COBOL, software company experience, financial product background, and a zealous commitment to excellence.

# **Customer Services** Account Managers

We treat our customers as partners, not adversaries. Your job: customer advocate. Anticipate customer requests before they become demands. Find out what kind of technical and functional help they need to implement and upgrade our financials and human resource software--and see that they get it. Plug them in to other resources.

You've spent at least 7 years doing product or technical consulting for HRMS or financial applications software. Extra points for expertise in RDBMSs, SQL, Oracle, COBOL, and 4GL development tools. Required: great communication skills, a take-charge attitude, and a desire to be on a winning team. Positions available at our offices in Walnut Creek, California, Teaneck, New Jersey, Chicago, Boston,

# Professional Services Consultants

Long ago you mastered SQL, COBOL, Oracle, Sybase, DB2, and 4GL development tools. Now put all those skills to work--and add in the creativity you bring to solving multi-tiered technical and functional software implementation problems. Your clients--our customers--are some of the bestknown names in corporate America. If you understand why we treat our customers as partners--not adversaries--you can help them successfully implement our blockbuster HRMS and financials software.

You're adept at leaping over tall buildings in a single bound, and hopping on planes with short notice. You have 5-7 years experience in the areas noted above. And a consuming need to have fun while you're working. Join an extraordinary company doing some remarkable things. Positions available at our offices in Walnut Creek, California, Teaneck, New Jersey, Chicago, and Atlanta.

Join the PeopleSoft team and share in our excitement. We offer excellent salaries, progressive benefits, an incentive compensation plan, and a comfortable environment where people really enjoy their work. If you meet the qualifications listed above, send your resume, specifying position of interest, to: PeopleSoft, Dept. CW0321, 1331 No. California Blvd., Walnut Creek, CA 94S96. PeopleSoft is an equal opportunity/ affirmative action employer.

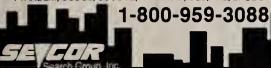
# **AS/400** Client/Server Chicago-Wisconsin

# **Tandem-UNIX**

Nat'l Consulting & Contracting

SEVCOR is a leader in the recruitment and search of information Systems professionals.

- AS/400, System 38 or 36; RPG or COBOL
   Systems Administrator, UNIX, C, HP a + (Chicago)
- C, C++; UNIX, OS/2, Windows, X-Windows
   Sybase, DBA; (Chicago); UNIX, C
   TANDEM, COBOL, SCOBOL, PATHWAY, SQL, TAL, BASE 24



COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25

STRATUS

# MUMPS UNIX

SUN, HP, RS/6000, GUI, SDK Powerbuilder, C++, Visual Basic Fulttime/Consulting Positions available in the US/ABROAD

# STRATEM

800-582-JOBS TEL (212)967-2910 FAX (212)967-4205 124 W. 30th St. Suite #302 New York, N.Y.10001

# TANDEM PROFESSIONALS COBOL • SCOBOL • ENSCRIBE • SQL **PROJECT MANAGERS** •

PROGRAMMER/ANALYSTS ANALYSTS CIScorp Penn Center West II, Suite 430 Robert Dougherty-MS 0757 Pittsburgh, PA 15276 (800) 969-0099, (412) 787-3070 (fax)

Equal Opportunity Employer

CISCORP is a preferred service provider for Tandem solutions nationwide. Office locations: Pittsburgh, Pennsylvania • Sunnyvale, California Atlanta, Georgia • Philadelphia, Pennsylvania

Third party products mentioned herein are trademarks or registered trademarks of their respective companies

# SMALLTALK PROFESSIONALS

*LEADING* OBJECT TECHNOLOGY Consulting Firm Seeks EXPERIENCED PROJECT LEADERS & PROGRAMMERS

Roth Well International, RWI has Challenging Projects Across the US



For Immediate Consideration: FAX Resume (713) 661-1156 or Call Mike 800/256-0541



# EMPLOYMENT OPPORTUNITY IN TRAINING IN SAUDI ARABIA

A Leading Training Organization in the Middle East - The Institute of Public Administration (IPA) - announces the availability to work in training, consultation, and research in the following fields:

#### Field

- ADW Case Tools Application Developer
- MVS System Programmer
- DB2 System Programmer
- CICS System Programmer
- Data Communication & LANs - Macintosh HW/SW Training
- & Support
- IBM P.C. & Applications
- MVS Master Console Operator
- C, PASCAL, 370 Assembler, SAS, Visual Basic, and Informix 4GL

#### Qualifications

Doctoral & 2 years experience, Master & 3 years experience, Bachelor & 5 years experince. Same Qualifications. Same Qualifications. Same Qualifications.

Same Qualifications. Same Qualifications.

Same Qualifications. Same Qualifications.

Same Quaifications.

(Note: IPA Environment is "MVS/XA, DB2, COBOL, ADW". Training will be conducted in Arabic).

# **BENEFITS**

- Competitive Salary.
  - Free Housing.
- Annual 45 days paid vacation.
- Tax free income in Saudi Arabia.
- Airline tickets for individuals & family (4 tickets maximum).
- Opportunity to work in Riyadh, Jeddah, and Dammam.
- Free medical treatment in public Hospitals.

# AND MANY MORE..

Send Resumes and Credentials to:

**Director General, Administrative & Financial Affairs** IPA, Box 205, Riyadh 11141 **SAUDI ARABIA** 

TEL: (011) 966-1-479 0762 FAX: (011) 966-1-479 2136

-SECA 630 Sentry Parkway - Suite 200

A leader in software engineering, methodology, process management, CASE, education, and eonsulting is expanding its world-elass staff.

Sr. Sales Executive: 5 years experience selling software engineering products or professional services. Background in methodologies, CASE, and software engineering is desirable. High energy, dynamic personality, and excellent verbal, written, and presentation skills are necessary. Must communicate effectively across all levels of an organization. Educator/Consultant: Looking for people who possess many of the following: BS (min) in CS or equiv.; exp. in: IE, OO, SA/SD; teaching; CASE; proj. management. Must be a team player, able to work independently, motivated, organized, pragmatic, and entrepreneurial. 40% min. travel. Please fax your resume and salary requirements to 215-834-5723. Direct applicants only

# **CONSULTANTS NEEDED**

CCC is o provider of softwore services to business and government. Immediate salaried and hourly openings in GA, TX, NC and NM. All technical disciplines including software professionals with.

- DB2 / ORACLE DBAs 4TH DIMENSION
- ORACLE / SYBASE
   SMALLTALK V & 80
- ORACLE Finonciols
   WALKER Pockages
- ADW design/construct
   DOE Q / L Cleorance

Nail resume with salary requirements and location preference (fox 404-512-0101) or call:

Comprehensive Computer Consulting, Inc. 7000 Central Parkway - 404-512-0100 Suite 940 - Atlanta, Georgia 30328

# CONSULTING & FULL TIME **POSITIONS**

DICE is a FREE online job search service, providing detailed information about current contract and fulltime positions across the USA Use your computer and modem to access the latest job openings. It's a confidential, easy to use, no cost way to search for a new job.

- D ATA PROCESSING NDEPENDENT
- C ONSULTANT'S

# **ONLINE Number:** 515-280-3423

Contact DICE via 1200/14400 baud Modem 8-N-1 A service of D&L Online, Inc.

515-280-1144

# CONSULTANTS

AiChas over 35 locations servicing our Fortune 500 clients with openings in a wide range of technologies. We offer a competitive compensation package on either a project or salaried basis with comprehenyears professional experience EOE. Send or fax your resume:

Analysts International Corp. P.O. Box 39612 Minneapolis, MN 55439 Fax (612) 897-4544

# **HR Systems Professionals**

The Application Group Inc., a leading implementor of Human Resource Information Systems, is seeking data processing professionals with one or more of the following skills:

- Client-server Architecture
- SQL/SQR
- ORACLE
- PeopleSoft · GUI
- Gupta Sybase
- Informix
- HRIS Project Management

We depend on talented, motivated careerminded people and we reward them with excellent salaries & benefits, 401(k) and a unique bonus program! If you can travel, but like to be home on weekends, mail or fax your resume or call:

(EAST OF THE MISSISSIPPI) Paul Abrahms, Two Mid-America Plaza, Suite 800, Oakbrook Terrace, IL 60181. 800-762-4170. FAX: (708) 954-2336.

(WEST OF THE MISSISSIPPI) Jeff Lusk, 200 Pine Street, Suite 800, San Francisco, CA 94104. 800-421-1627. FAX: (415) 765-5200



THE APPLICATION GROUP INC.

Equal Opportunity Employer

# ORACLE or CA-DATACOM/DB

Long term consulting positions with OMNItech. Start April, May or June. Project management; functional and technical analysis; application development, programming and support; database development, administration and support; and system support work. All require proven expertise in either ORACLE or CA-DATACOM/DB. Opportunities available across the country for Full Time or Hourly (W4) staff.

ONNITECH Revises Plaze 1

Edison, New Jersey 08837

Consulting Services In: Phone: (908) 225-5577

Fax: (908) 225-0032 An Equal Opportunity Employer

For projects in the USA, Germany, The Netherlands and South Africa we are looking for

# SAP Specialists

(functional & technical)

Trans-Link USA, Inc. 401 City Ave. Suite 725 Bala Cynwyd PA 19004



Tel 215.668.2975 Fax 668.2976

Immediate positions available for all existing modules in R/2 AND R/3

Elite Computer Consultants

Opportunities available for Data Processing profes-sionals with the following skills:

C/C++/SQL
SYBASE
UNIX/MS Windows
Visual Basic
Sybase
PowerBuilder

Please call, fax, or mail re-sume to: ECOM, 10333 NW Fwy, Sulte 414, Houaton, TX 77092. Phone 713-686-9740, Fax (713) 686-

# I/S PROFESSIONALS

- Director Level, DBA, Sys Sftwr, Change Cntl Mgr, host & LAN
   Data Administrator/Analyst, SE Perm
   PowerBullder/Sybase System Architects & Developers
   COBOL/CICS/VSAM/DB2, banking
   COBOL/IMS DB-DC, Health ins or Student Loans

- Ins or Student Loans
  UNIX, C, GUI, Oracle, Ingress, Progress
  AS/400 RPG, COBOL

rush resume to Ernie Snuggs Central Technical Services 550-15 Wells Road Orange Park, FL 32073 Ph (904) 264-4251 FAX (904) 264-7541

# NATURAL/ADABAS

318 Bear Hill Road Waltham, MA 02154 (617) 890-7555 (617) 890-0904 (fax)

# CICS, DB2, Total or Mantis Cyborg, Payroll Module a + Visual Basic, MS

COMPUTER CONSULTANTS Spring is just around the comer. . .time for a fresh start.

Susan con't .CICS, VSAM,

Mantis a +

Sr. Prog/Analysts: ·RS6000, AIX and Sybase a + Prime Info/Pick Basic Help Desk: of SW Pkgs. E:Mail, CC:Mail Mainframe, Midrange,

Prog/Analysts
Cobol II, CICS, VSAM, COBOL, TOTAL. ICI. ·Tandem, Pathway ·IMS, Cobol, CICS

Prog J Analysts:
-Informix 4GL AS/400, RPG ·PC and MAC variety ·NOMAD ·Easel ·IDMS/CICS

**HELP WANTED** 

Programmer, Engineering and Scientific: Converts Engineering problem formulations to format processible by computer. Encodes equations for processing, by applying extensive knowledge of manufacturing engineering and advanced mathematics. Understanding of capabilities and limitations of computer systems. Enters programs into

and limitations of computer systems. Enters programs into computer system. Reviews results with interested personnel to determine the necessity of modifications or reruns and to observe the display generated. Develops new subroutines and expands program to simplify statement, programming, or coding of future problems. Required 4 years of college with B.S. in Engineering or Computer Science. Experience in C/X-Windows and 3D Graphics on UNIX operating system. Salary

obows and 30 Graphics of UNIX operating system. Salary \$22,007 to 25,000 depending on experience. Applicants send resume to N.M. Dept. of Labor, 226 S. Alameda St., Las Cruces, New Mexico 88004, Job Order No. 426479.

Please Reference Job # CW-4 9417 Lackland Rd; Overland, MO 63114, (314) 429-ROSS-FAX 429-7600

strong+

# Data Base Development Manager

Associates, Inc.

NACCB Member

Attn: Susan

Prog/Analysts:

EDI exp., IBM

Cobol

(Several Positions)

# \$100,000+

Dynamic West Coast organization seeks an experienced, vigorous professional to manage and develop both a substantial data base and a quick response department that thrives on long hours and short deadlines. The successful candidate will have 5+ years hands-on Oracle experience, bachelor's degree, and the poise to Interface effectively with senior level marketing and technical personnel; familiarlity with Unix, Novel, and Windows also required. Six figure compensation. Fax resume and salary history to Tom O'Brien 212-888-4312.

# Full time & Consultant Opportunities available in

- the following technologies:
- Sybase, Oracle, Informix tools
   PowerBuilder
- C, C++, Unix
  Microfocus
  COBOL-AD/MVS
- Knowledgeware tools
   Visual C++, MS Windows, SDK
   AS/400, RPG III
   DB2, CICS, IMS, IDMS

- Lotus NotesD&B applications, Millennium

Strictly confidentiality. Call or send



Jane Jackson & Associates, Inc.

Wekiva Springa Rd., Ste. 221 Longwood, Florida 32779 (407) 865-5757

PA - OHIO - WV

Consulting and full time poal-tions available immediately.

DB2, CSP, IMS, CICS P/AS MVS & VSE System Progs SAS/FocusNaturai P/As Oracle, Sybase, Progress DBAs AS400 RPG & Cobol P/As ADW/IEF - Data Modeling Foxpro/MS Access C/C++/MS Windows/UNIX Powerby iller/Gupta P/As

Reply with a cover letter and resume to:

DB2, CSP, IMS, CICS P/As

Powerbuilder/Gupta P/As

A.C. Gy Company

PO Box 1262, Canonsburg PA 15317. 412-941-2220 FAX 412-942-9140

Programmer/analyst, Senior. Write system design specifications; manage analysis team; perform object analysis, system design and initial object design. MS in CS or EE + 1 year exp. in job offered, programmer/analyst, graduate assistant or related work reqd. Exp. to include: exp. in software/communication systems; knowledge in object oriented analysis and design and embedded real time system design or operating systems); know. in C++ (3 college cred. hrs. of the program. language); know. in telecommunications (6 college cred. hrs. of computer networks or data comm. concepts). \$5416.67/mo. Job site/interview: Richardson, TX. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #TX6944454. Ad paid by an Equal Opportunity Employer.

# SAUDI ARABIA TAX FREE INCOME

- POWERBUILDER/ORACLE
  IMS, DB2, TELON,
  COBOL II
  ADW, FORESIGHT
  COMMUNICATION
  ENGINEERS
  IMAGING SPECIALIST
  EDI SPECIALISTGENTRAN, EDIFACT, X.12

One-year renewable contracts, NEED IMMEDIATELY, fax resume to 011-9663-895-4897 or send resume to:

Saudi Brokers P.O. Box 1583 Al-Khobar Airport 31952 Saudi Arabia

TX area client site) Analyze, design, develop, code, test, maintain, and document programs for financial and commercial applications systems, using COBOL, CICS, and DB2 on IBM mainframes. Bachelor's degree in Comp. Sci.. Math. Engineerin Comp, Sci., Math, Engineering, or Business Admin. and 18 months. exp. in job req. 40 hrs/wk, 8:30-5, \$37,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX6944459. Ad Paid by

an Equal Opportunity Employ-

Notural/Adobas, Natural/DB2, ond Construct programmers and onolysis needed for vorious long lerm positions throughout the country. Please call:

LENCO COMPUTER CONSULTING

# Sunbelt Opportunities

AS 400 P'A S NC, VA, TN
EDI P'A'S NC, VA, TN
EDI P'A'S NC, VA, TN
MAPICS P'A'S NC, VA, TN, OH
PC (OS'2, C) P'A'S GA, TN, MO, KS
UNIX C++ P'A'S GA, TN, MO, KS
UNIX C++ P'A'S NC, GA, VA, TX
IMS DB-DC P'A'S NC, GA, VA, TX
IMS DB-DC P'A'S NC
TANDEM P'A'S NC, TN, OH
TANDEM S'P'S Allanta
OPACLE P'A'S NC
MVS or DB2 S'P'S GA, TN, AZ, PA
EDP Auditors ... GA, TN, SC, FL, AL
National isercining firm, 12 years in data

SUNBELT RECRUITERS 2235-400F E. Flamingo Road Las Vegas, NV 89119 · (702) 369-2066

Attn: Rick Young, C.P.C.

# REWARD

There's Plenty at CPU.

If you're a seasoned software engineer who's looking for the kind of personal and professional reward that comes from working with the most advanced technology, you're looking for Computer People Unlimited. We're the Midwest's premier professional software services firm handling a full spectrum of assignments.

#### SOFTWARE ENGINEERS

C · C++ · DOS MICROSOFT WINDOWS · OOAD · OS2 SMALLTALK · UNIFACE · VISUAL BASIC RPC · APPC · LU6.2 · SQL ENGINES DRDA (DDCS) · GUI TOOLS · TEST METHODS

You will be rewarded with a highly competitive salary and complete benefits. To find out more about these Midwest opportunities, please call or fax your

Appleton/Green Bay-Marv Miller Phone: 1-800-960-1278 or Fax: 414-738-4499 Milwaukee—Julie Endlich

Phone: 1-800-527-8462 or Fax: 414-225-4011 Madison—John Manyo

Phone: 1-800-280-2782 or Fax: 608-223-3810

Minneapolis—Scott Fleischmann Phone: 1-800-278-2850 or Fax: 612-338-3210

You may also send your resume to: Computer People Unlimited, Dept. CW, 732 N. Jackson Street, Milwaukee, WI 53202. Sorry, no entry level positions available. We are an equal opportunity employer.



Building On Our Strengths.

COMPUTER PEOPLE UNLIMITED INC.

COMPETITIVE SALARY

BENEFITS

TRAINING

MANAGEMENT SUPPORT

CHALLENGING ASSIGNMENTS

LOCAL **ASSIGNMENTS** 

MIDWEST OPPORTUNITIES

> INDUSTRY LEADER

CAREER GROWTH

> ANDMORE

PCS GROUP Client/Server Division, A Sybase Teaming Partner is currently expanding our practice into providing complete business solutions on Client/Server architectures. We are searching for highly motivated, high energy individuals who enjoy cutting edge technology and are serious about future professional advancement. Qualified candidates will possess 2+ years in the following areas:

- Front End Development

  PowerBuilder

  SQL Windows

  Object Oriented
- Back End Development

  Sybase Oracle
  SQL Base
- Client/Server
  Mainframe Integration

   Sybase MDI Trinzic
- Additional Requirements

  IDMS, ADS/O, Cobol

  DBA with UNIX

  Natural/Adabas

- Mainframe Systems Programmer w/UNIX Platinum Financial Packages

PCS Group offers exceptional training opportunities in our state-of-the-art training facility, outstanding incentives and ex-cellent benefits. For immediate consideration, please send or fax your resume to:

# PCS GROUP

9300 Shelbyville Rd., Suite 1103 Louisville, KY 40222 502-339-2900 800-682-9784 FAX: 502-339-2888

# **PROGRAMMER**

Legent Corporation, a leading international high-technology firm, has a challenging opportunity for a self-directed professional whose 3-5 years experience in systems programming and automated operations were gained working in a large IBM shop. This key position requires a strong background in IBM assembler and REXX coding. Excellent interpersonal skills and a BS in Computer Science, a related discipline or an equivalent combination of education and experience are essential. Familiarity with OPS/MVS or AutoMate/MVS is preferred.

egent Corporation offers a competitive salary and benefits package. For confidential consideration, please send your resume to: Human Resources (KH), LEGENT CORPORATION, 2000 Park Lane, Pittsburgh, PA 15275. An Equal Opportunity Employer M/F/D/V.

You've probably heard the name Sybase a lot lately, and with good reason. Sybase is established as the leader in client/server-based software products and services for on-line, enterprise-wide applications.

you should have working knowledge of Sybase products (or another RDBMS), logical and physical database design, performance tuning, database administration, UNIX and C.

Our phenomenal success continues to create exciting opportunities in our Professional Services organization which works directly with our customers to help them develop the skills and knowledge to fully take advantage of enterprise client/ server computing. If you're a highly motivated professional who enjoys challenges in leading-edge technology, don't miss this chance to join our team to design,

build, test, deploy and maintain complete client/server solutions in a wide range of industries and applications

INNOVATION BY DESIGN

areas Consultants

You will use your experience to manage consulting engagements spanning the life cycle of

RDBMS-based systems development. This includes identifying and applying the appropriate tools, methodologies and techniques to support optimum database and/or applications development.

Consultants must have a BS/MS in Computer Science or equivalent, and at least 5 years of systems consulting or MIS experience, including logical and physical database design/implementation and applications development. Sybase experience is strongly preferred, but we will consider other RDBMS background. Demonstrated project management skills, experience with CASE tools and structured development methodologies, C and UNIX are also strongly preferred. Excellent verbal and written communication skills are essential.

# **Instructors**

Use your technical knowledge and platform skills to deliver our highly demanded courses, seminars, and training programs at Sybase Education Centers and at customer sites. Responsibilities include classroom management and customer interface to transfer Sybase knowledge to assure customer success with their investment in Sybase.

These highly visible positions require a BSCS (or equivalent) and 5+ years' technical instruction or database and application design experience. In addition to excellent communication and presentation skills,

# Architects

Interface with customers at senior levels as you apply your expertise in the principles of architecture and relational database design to client/server and distributed computing platforms. These key positions will help to enable the enterprise-wide client/server computing model, while assuring customer success in the Sybase environment.

In addition to an excellent understanding of the systems development life cycle, methodologies and techniques, these positions require at least 10 years' RDBMS (including Sybase), SQL, C, UNIX and mainframe experience. Candidates must also possess outstanding communication, presentation, and problem-solving skills.

For opportunities in ATLANTA, BETHESDA, and FEDERAL areas, please send your resume via e-mail to: johns@sybase.com. You may also fax it to: (301) 897-1605. Or, write to Sybase, Inc., Professional Services, ATTN: AD Code: JS, 6550 Rock Spring Drive, Bethesda, MD 20817.

For opportunities in BOSTON, NEW YORK/NEW JERSEY, TORONTO and CALGARY, please send your resume via e-mail to: mbohane@sybase.com. You may also fax it to: (617) 270-4158. Or, write to Sybase, Inc., Professional Services, ATTN: AD Code: MJB, 77 South Bedford Street, Burlington, MA 01803.

For opportunities in CHICAGO, DALLAS, DENVER, DETROIT, HOUSTON, LOS ANGELES, PHOENIX, SAN FRANCISCO BAY AREA and SEATTLE, please send your resume via e-mail to: cundall@sybase.com. You may also fax it to: (510) 922-5299. Or, write to Sybase, Inc., Professional Services, Attn: AD Code: CW, 2000 Powell Street, Suite 705, Emeryville, CA 94608. Sybase is an equal opportunity employer.



The Enterprise Client/Server Company<sup>th</sup>

All tradenames belong to their respective holders. ©1994, Sybase Inc. All rights reserved

# PROGRAMMER ANALYSTS & **BUSINESS SYSTEMS** CONSULTANTS

**Global Opportunities** Begin in Denver.

American Management Systems, Inc. is a leading international information systems consulting firm. The Mobile Communications Industry Group, based in Denver, Colorado, develops sophisticated customer information and billing solutions for the Telecommunications industry. We are seeking highly motivated self-starters to relocate to the Denver area, with a willingness to travel domestically and abroad, for the following positions:

# PROGRAMMER/ANALYSTS BUSINESS SYSTEMS CONSULTANTS

Experience in one or more of the following areas is required:

- Application Development (UNIX, AIX, VMS, MVS Platforms)
- Database Management Systems (SYBASE, INFORMIX, DBMS, DB2)
- Client/Server Architecture
- Object Oriented Development (Smalltalk, C, C++)
- GUI Design & Implementation
- Knowledge of Telecommunication Billing Systems, PCS, Cellular

Fluency in European languages is a plus. Four year degree required.

We offer a highly competitive compensation and benefits package. For immediate, confidential consideration, please send your resume and salary history to: Professional Staffing, Dept. CW, American Management Systems, Inc., 66 South Van Gordon St., Lakewood, CO 80228 An Equal Opportunity Employer M/F/D/V.



AMERICAN MANAGEMENT SYSTEMS, INC.



Stein Mart's recent successful growth as One of America's Fastest Off-Price Fasion Department Stores has provided additional positions for Programmers in the data processing area. We need you if you have 2-3 years experience with the following:

# **CONTRACT &** PERMANENT IMMEDIATE INTERVIEWS

- · NATURAL/ADABAS

# NATURAL/ADABAS DB2/COBOL/CICS MARSHALL ILSLEY/DDA HOGANDDA/TDA HOGANDDA/TDA POWERBUILDER, Sybase CPCS, Super MICR IMS DB/DC with ATM and POS experience VECTOR 5 CAMBAR, SAP SYSTEMS EXPERIENCE 6033 W. Cemury Blvd. Suite 260 Los Angeles CA 60045 Ph (310) 215-9006 Membar of NACCB

# Carolina's/Southeast

PowerBuilder P/A's
ORACLE/SYBASE DBA'S
SQ-80K
MALLTALK
HOGAN P/A'S
HOSDB2/IOMS
40-50K
EDP Auditors
UNIX/G/C++/OOP
10FA/UDATACOM
ORACLE V6 0 8 7.0.
40-50K
MVS/C/CS/COBOL
35-45K

For additional information on these and nationwide opportunities,

Call Don Mullis (704) 366-1800

CORPORATE STAFFING P.O Box 221739 Charlotte, NC 28222-1739 (704) 366-0070 (Fax)

# Rohn Ragers Cansulting 1212 6 <sup>1H</sup> Ave, 9th Fl, NYC 10036 800-338-5995 212-921-1319 Fax 212-302-4363

# AS400 **PROGRAMMER**

- 3 years with AS400
   RPGIII
- Coding **■ Subfiles**
- **Ability to work** with users

Please send resume to:

STEIN MART

1200 Gulf Life Dr Personnel Dept

# Immediate Interviews MAINFRAME

# **CLIENT SERVER**

Visual C++ • Gupta • Sybese
Powerbuilder • Informbx • Banyan
Peoplesoft • Novel • Clsco
Teknecron • Oracle • Unbx
Lan/Wan • Excel • SDK
Smalltalk • Access • C++
Sys/Admins • TCP/IP • Mottl
Windows • VAX • Paradox
HP Sys Admins • C/Fincl • Nettlb

# **VICE PRESIDENT** of Information Systems **IMAGINATION INNOVATION**

**IMPLEMENTATION** 

Computerworld, the newspaper of record for the computer industry, is seeking a Vice President of Information Systems. As a key member of the Computerworld Executive Committee, you will be responsible for helping to define Computerworld's technology-related business mission and executing that strategy quickly and effectively. You must perform this role in a business environment that is highly competitive and dependent upon the strategic use of leading edge technologies. You must also have knowledge of a broad range of technologies with the ability to discern their business use and define potential applications to the Executive Committee. In addition, the VP of IS is charged with the primary responsibility for managing Computerworld's Information Systems organization and ensuring that it is efficient and responsive to the needs of a demanding and growing user base.

Specifically, candidates should have detailed knowledge of client/server technology, computerized publishing and production, electronic mail, local-area networks, sales force automation, personal computer installation and support, remote office automation and support and group-oriented enabling technologies (i.e. groupware). A working knowledge of wide-area networking and UNIX is also desirable.

Experience/Education: Technical experience, preferably in the software and publishing arenas. Experience in systems applications related specifically to publishing highly desired. BS. in computer science or management information systems preferred. 8-12 years of progressive technical and managerial experience.

We offer an excellent salary and a progressive benefits package in a dynamic and challenging environment. Please send resumes to: Susan Perry, Director of Human Resources, Computerworld, Inc., 375 Cochituate Road, Framingham, MA 01701-9171. No phone calls please. An equal opportunity employer..by choice.

# COMPUTERWORLD

An IDG Company

Software Engineer, 40hrs/wk., 9am - 5pm, \$42,000/year. Software development & testing for compilers, debuggers & related tools. Duties include: development of object file converters, object file linker, and user interface for debugger; target level debugger interfece for embedded systems boards. Tools: UNIX/C; Sun Workstations; 68000 essembly; MS-DOS; MS Windows. M.S. in Computer Science as well es one year experience as a Software Engineer or Programmer Analyst required. Previous experience as a Software Engineer or Programmer Analyst required. Previous experience as a Software Engineer or Programmer Analyst required. Previous experience as a Software Engineer or Programmer Analyst required. Previous experience and system testing of embedded systems; development of tools to automete testing environment; C/UNIX; Sun workstations. Greduate education must include one project on design & implementation of a parser and compiler. Must heve proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Jean Woodson, Reference #V-IL-11431-W. NO CALLS. An Employer Paid Ad.

SOFTWARE DEVELOPMENT ENGINEER - Provide technical support to end users and internal EDP staff. Maintenance, en-hancement & future development nancement & future development of maInframe software. Req. Bachelor's or equiv. (9 months professional exp = 1 year ecademic) in Data Processing or Computer Science & 2 yrs exp in job or releted EDP occupation. Exp must incl: VM Architecture, ASSEMBLER, PL/1, FORTRAN, 3270. Data Stram Processing. ASSEMBLER, PL/1, FORTRAN, 3270 Deta Stream Processing, MVS, JCL, TSO, REXX, XPAF. \$38,000/yr. 40 hrs/wk. 9:00am - 5:00pm. Job Site: Longwood, FL. Send resume to Job Service of Florida, 3421 Lawton Road, Orlando, FL 32803-2999. Re: Job Order # FL 0986884.

# CLIENT/SERVER DISTRIBUTED **PROCESSING**

Join us for major projects in the Southeast! We need individuals with at least 2 years experience with any of the following:

INFORMIX/INFORMIX 4GL or similar under UNIX; C++, SQL, MICROFOCUS, SYBASE, INGRES, ORACLE, WINDOWS, GUI, POWERBUILDER, CASE, etc.

and/or Any skills in object-oriented design and analysis.

We offer competitive salaries & excellent benefits Including a 401 (k). Call and/or send resume to:

TECHNOLOGY SOLUTIONS, INC. PO Box 212098 Columbie, SC 29221-2098

FAX: (803) 359-7031 TEL: (803) 359-6079 Toll Free: 800-849-4874

# IMS/ DB2

Positions in Charlotte, NC

Contact: (704) 527-8667 800-249-7269

SENIOR SOFTWARE ENGINEER: 40 hrs./wk., 8am-5pm, \$46,000/yr. Carry out analysis, design and development of s/w applications systems on IBM 3090 mnfms utilizing MVS, IDMS, ADS/O, IDMS, DB2, CICS, COBOL and ASSEMBLER. CICS, COBOL and ASSEMBLER. Perform requirement analysis, prepare functional specifications, prepare functional specifications, prepare test plans & test cases, provide assistance in implementation scheduling. Require Bachelor's degree in Computer Science or Electrical Engineering, 5 yrs. expr. in job offered or 5 yrs. expr. as Systems Analyst/Programmer. Expr. in design & development of systems on IBM 3090 utilizing MVS, CICS, DB2, IDMS, ADS/O, COBOL & Assembler. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 11294.

SOFTWARE ENGINEER: 40 hrs./ wk., 8am-5pm, \$48,500/yr. Design and develop computer software systems on IRM 3000 maintrame computers utilizing MVS/TSO, CICS, DB2, COBOL II and SDF II. circs, DB2, COBOL II and SDF II.
Gather system requirements and
assist in the implementation of the
system and user documentation.
Prepare detailed designs, program
specifications, test plans and data.
Require Bachelor's degree in
Computer Science, 3 yrs. expr. in
ob offered or 3 yrs. expr. as Systems Analyst/Programmer, Senior
Software Engineer. Exper. in systems design and development on
IBM 3090 or ES 9000 utilizing
MVS/TSO, CICS, COBOL II and
SDF II. "Employer paid ad".
E.O.E. Send resumes to: 7310
Woodward Ave., Rm. 415, Detroit,
MI 48202. Ref. No: 10994

# TAL/ BASE24

Positions in Charlotte, NC

**Contact:** (704) 527-8667 800-249-7269

This Space for HIRE! CALL:

800-343-6474

in MA., 508-879-0700. ask for John Corrigan, Vice President Classified Advertising.

# COMPUTERWORLD

Weekly. Regional. National.

And it Works!

# **COMPUTER CONSULTANTS**

Our Client, a major oil company in Saudi Arabia requires the services of 31 Consultants to fill the positions described below. As the most important supplier of computer consultants to that organization, we offer one-year renewable contracts with high TAX-FREE salaries & benefits: Int'l. transport, free housing, medical insurance, local transport allowance, paid vacation leave.

#### **ADW Senior Consultants**

To support information Engineering and ADW Toolset, assist project teams in using ADW (Knowledgeware) & FORESIGHT, develop, Implement, support applications planning & control functions, create strategic information systems plans. Candidata should have acted in a senior project manager role with 10 years DP axperience with thorough knowledge of IE concepts, ADW (Knowledgeware) Toolset, FORESIGHT methodology and JAD facilitation.

24 Positions

#### SYSTEMS ANALYSTS

To develop, enhance, maintain software for mainframe computer applications systems, to conduct feasibility studies & general system design. Candidata must have 6 years DP axperience with thorough knowledge of DB2, COBOL2, IMS DB/DC, Telon.

#### **IMAGING Senior Consultant**

with solid axperience in Imaging & Workflow applications, using packages such as Filenet, Archis, Plexus, Image Plus, Mars, atc. and Scanners, Jukeboxes, CD-Rom.

#### **EDI Senior Consultant**

with experience in developing & implementing large EDI applica-tions using GENTRAN, UN/EDIFACT (Ansi X12), X-25 & X-435.

Please Send ASAP or preferably FAX your resume with a skills in-ventory matrix detailing your experience in number of years to:

Al-Khaleej Computers - HRD P.O. Box 2062, Al-Khobar 31952 Saudi Arabia Fax: (966) 3-894-6032

# CONSULTING

Contract Solutions is offering long-term consulting opportunities locally and throughout the United States. Most positions poy between \$80,000-\$130,000 per year.

- ◆ ORACLE FINANCIALS, UNIX, C, PRO\*C
- ◆ SYSTEMS ADMIN: SOLARIS, VMS, UNIX, ULTRIX, NT
- ◆ APPL PERFORMANCE, RDBMS, UNIX, C
- ◆ UNIX HELP DESK: X.25, TCP/IP, SNA, FDDI, NFS
- ◆ DBA'S: SYBASE, ORACLE, RDB, INFORMIX
- ◆ COBOL, COBOL II, DB2, CICS, VSAM
- ◆ C++, UNIX OR WINDOWS 3.1 OR VMS
- ◆ ALPHA, OSF/1, C
- ◆ WANG, PACE, COBOL
- ◆ SYBASE, UNIX, X-VIEW ◆ APS, IMS DB/DC
- ◆ VISUAL BASIC, MS ACCESS ◆ ORACLE, FORMS 3.0, C

- ◆ MLS+, UNIX, C OR ADA ◆ GENESIS PR/PENSION
- ◆ C, VAX/VMS, RDB
- ◆ M&D MILLENIUM A/P

Contract SOLUTIONS

603-893-6776 Fax: 603-893-4208 800-998-csi 1 (2741)

Two Keewaydin Drive Salem, NH 03079-4875

> AS/400 **SYSTEMS ANALYST** FRANKFURT, GERMANY

The Army Recreation Machine Program, is recruiting for Systems Analysts/Programmers in Frankfurt, Germany, who can design, develop, implement, and maintain data processing functions for IBM AS/400 Mid-Range computer systems. Candidates must possess:

Mid-Range computer systems which provided knowledge of its related software (RPG400, CL, SEU, SQL, and OS-400 Operating Sys-

A four-year degree and experience with Clarion, Dbase, C., Communications, and/or Novell Networks is preferred.

Salary commensurate with experience from \$27,000 to \$35,000 per year. Candidates recruited from the United States may receive a tax-free housing allowance and paid moving costs. A three-year transportation agreement is required. A resume, with salary history, must be

U.S. Army Community & Family Support Center (CFSC-HRP-S) 2461 Elsenhower Avenue Hoffman I, Room 1222 Alexandria, VA 22331-0523

The initial cut-off date for consideration is April 15, 1994

# SAP'S R/2 & R/3.

# Software Professionals

"SAP's dedication to superior technology has made us one of the largest, most successful and fastest growing software companies in the world."

With the advance of open systems, business process technology is the next strategic challenge. For this reason, many forward thinking companies have already put the R/3 System to work.

Like our proven R/2 mainframe software, SAP's client/server based R/3 is a fully integrated package, managing company-wide applications from Manufacturing, Finance and Order Processing to Human Resources functions.

The following positions are available at our operations located throughout the United States -Philadelphia, Boston, Dallas, Foster City (San Francisco), Atlanta, Chicago, Los Angeles and Northern New Jersey.

# **PRESALES**

APPLICATIONS - Qualified individuals will have 3 - 5 years experience in a presales software environment in either Manufacturing, Sales/Order Processing, Finance and/or Human Resource Applications.

**TECHNICAL** - Applicants should have presales experience in any of the following areas: Development Tools, CASE, and Workflow Management/Office Automation Systems.

Candidates for these positions should have "hands-on" software installation experience and the ability to aid in the positioning of the sales effort for success.

# CONSULTANTS

Candidates should possess a minimum of 3 - 5 years experience in the installation of various software packages related to Manufacturing, Sales/Order Processing and Distribution, Finance, and Human Resources. Prior experience in a consulting and/or software environment would be ideal.

# SYSTEMS CONSULTANTS

Our R/3 system utilizes relational data base technology and runs on UNIX and other Open Systems with support for front ends running MS Windows, MOTIF and PM. We currently seek "hands-on" professionals with experience in the following: • Data Base Administration • **UNIX System Administration • Networking** 

We offer an exceptional salary and benefits package including profit sharing. Individuals interested in exploring these opportunities should FAX or mail a resume and salary requirements in confidence to: Recruiting Manager, SAP America, Inc., International Court Three, 300 Stevens Drive, Philadelphia, PA 19113. FAX (215) 595-4919. Equal Opportunity Employer, M/F/D/V



Integrated software. Worldwide.

POSITIONS AVAILABLE THROUGHOUT THE NATION

# CLIENT/SERVER **EXPERTISE?**

# JOIN A COMPANY WHICH TRULY SERVES ITS CLIENTS!

Unisys Corporation provides value-added, mission-critical business solutions to premier global customers. A client-driven industry leader, we are building a world class system integration practice which empowers companies to employ information technology to their strategic advantage.

Exceptional opportunities now exist for professionals possessing a minimum of 2 years expertise in *any* of the following:

- Client/Server Applications Full Life Cycle CASE TOOL (IEF, ADW or APS) Dévelopment
- Database Administration
- Application Development Management

A vast array of opportunities also exist for IS professionals with diverse talent, education and experience.

Take that next step in your career development, and tap into the power of Unisys, a multi-billion dollar, leading-edge integrator. We offer an open environment to stimulate creativity, on-going professional tions, and new projects to multiply capabilities.

Prior Unisys employees encouraged to apply. Interested applicants should forward resume to: UNISYS CORPORATION, Attn: MRS-MS F1K03, 3199 Pilot Knob Road, Eagan, MN 55121-1362. FAX: 612-687 2000 MV 55121-1362. 687-3306. We are an equal opportunity/ affirmative action employer committed to work force diversity.

UNISYS

# NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY COMPUTER SYSTEMS LABORATORY GRAPHICS SOFTWARE GROUP, COMPUTER SCIENTIST NEEDED TO WORK IN MARYLAND

Research and Development (R & D) Position: Development of graphics standards and conformance tests in support of an open systems environment.

- \* Plan, initiate, and conduct applied research leading to computer graphics standards, guidelines or other material necessary for more efficient utilization of computer graphics technology in an open systems environment.
- \* Design and develop conformance tests for the Programmers Hierarchical Interactive Graphics System (PHIGS). These tests determine conformance to the American National Standard Institute (ANSI), International Organization for Standardization (ISO), and Federal Information Processing Standards (FIPS) for PHIGS.

Qualifications: Bachelor's or higher degree that included 30 semester hours in a combination of mathematics, statistics and computer science. At least 15 of the 30 semester hours must have been in any combination of statistics and mathematics that included differential and integral calculus. One year of specialized experience equivalent to next lower grade in or related to the duties described above is required. Applicants must have skill in the use of ISO/IEC 9592 and FIPS 153 (PHIGS); skill in the use of ISO/IEC 9593.1 and ISO/IEC 9593.4, PHIGS FORTRAN and PHIGS C Language Bindings; and skill in the development of PHIGS conformance tests based on ISO and FIPS PHIGS stan-

SALARY: ZP-1550 Level IV (equates to GS 13/14) ranging from \$49,947-\$76,733, depending upon qualifications and experience. Position offers excellent career benefits and professional growth opportunities. The National Institute of Standards and Technology is an Equal Employment/Affirmative Action Employer, U.S. Citizenship required. Payment of relocation fees is not authorized. Please send your application for Federal Employment (SF-171); a copy of your college transcript or a completed OPM Form 1170/71 (list of College courses); addendum sheet addressing the skills stated above; and documentation verifying veterans preference if claimed to:

> U.S. Department of Commerce National Institute of Standards and Technology Office of Personnel and Civil Rights (NIST/94-0090/LC) Closing Date: 04/22/94 Administrative Building, Room A-123 Gaithersburg, MD 20899

#### Look at the BEST in the Northwest

## Client/Server Opportunities

BEST Consulting is a three year old, 12 million dollar success has become a mecca of High Technology and BEST has BEST place to work, the BEST staff the BEST service. has been recognized in a number of ways other than em-almost 200 consultants. We are proud of our **BEST** ac-

Highest ranked Systems Integrator in Washington CEO Magazine "High Tech 100" A Microsoft Solutions Provider Program Partner **NeXT Object Channel Partner** 

BEST has built a tactical team of professionals who have extene experience in the architecting and delivery of network based ent Server systems. This team is capable of providing Information Systems organizations not only with Client/Server expertise, but also a way to migrate from traditional systems to this new computing environment. This division of **BEST Consulting** is growing and we are looking for highly skilled professionals to add to our team. If you have expertise in any of the following areas:

Project Managers Program Managers Project Leads System Architects **Network Specialists** 

Relational Database Specialists Object Oriented Programming & Design CRC Cards **XACTION Processing** 

Please call or send your resume to our organization as soon as possible to  ${\bf JOIN\ THE\ BEST\ Consulting\ TEAM.}$ 

**BEST Consulting** 

1940 116th Avenue N.E. Bellevue, WA 98004, Attn. HAE (206) 637-9550 FAX

(206) 637-0130

Development Engineer Manager ii - Manage large dev. eng. projects, incl. dev. strategies & objectives, identify & allocate resources to assure achievement of objs. w/i est. budget & schedules, indent. & init. methods to improva process-

Software Engineer: Work on various proj incl dvipmnt of software on IBM 3090, MVS/XA over MCi satellita line thru 3174 controller & codex modern. Create insurance modules like UPS, LMS and PDE. involved in proj ping, coding, dsgning & troleshoting. Use ISO 9000/ISI 15000 stds. Dvip & convert from VSAM to DB2. Maka use of LMS & UPS & dvipsystem from axisting system in init. methods to improva processas, products, reduce cost, increase output; manage taam of s/w engineers in driving spec., design, implementation, integration & tast. of new VHDL language faaturas for VHDL simulators; matrix manage markating & customer support engineers in planning & axec. of interdisciplin. project activities; also cont. to Top Down Design planning. \$85,000/yr.; 40 hrs./wk. Req. B.S. in C.S., Math, E.E. or related field, and & yrs. axp. in software development; Exp. must include; min. 5 yrs. exp. in software development; convert from VSAM to DB2. Make use of LMS & UPS & dvip system from axisting system in iMS, CICS to DB2 & CICS. Dvip systs using CiCS, DB2, VSAM & JCL. Design & develop cost astimation, inventory, sales analysis & payroll systems. Bachelor in Engg or Compt. Science plus 1 yr axp. as software engineer or 1 yr axp. as software or technical consultant or syst analyst/axecutive. Must have one yr exp. in job duties if qualifying based on related occupation. In ileu of Bachelors will accept 3 yrs of college & 2 yrs of work axp. \$47,200/yr, 40hrs/wk, 9a-5p. Must have proof of legal authority to work in the U.S. Send your resume to Mr Bernard Childerston, Nebraska Department of Labor, P.O. Box 94600, Lincoln, Nebraska, 68509. Rafer to Job Order NE 0103184. This AD is paid for by the employer. yrs. exp. in software dev. project mgmt., incl. mgmt of ang. taam to meet bus. objs. & mgmt. of large, highly complex s/w projects, mgmt. of dev. of VHDL products; in depth knowledge of C or C++ developed in UNIX environment; exc. written & oral comm. skills. Place of employment and interview: Wilsonville, OR, If offered employment, must show legal right to work permanently in the U.S. Clip ad and send with rasuma to: Attn: Job Order #5550667, 875 Union Street, N.E., Room #201, Salem OR 973111. This company is an equal opportunity amployer and fully supports affirmativa action practices. yrs. exp. in software dev. project

and document financial and commercial applications systems, using CSP, COBOL, and DB2 on IBM mainframes. Bacheior's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yrs. exp. in job req. 40 hrs/wk, 8:30-5, \$36,500/yr. Apply at the Texas Employment Comthe Texas Employment Comresume to the Texas Employment Commission, TEC ment Commission, TEC Building, Austin, TX 78778, J.O. #TX6944461. Ad Paid by an Equal Opportunity Em-Scriware Developers PROGRAMMER/ANALYST:

hrs./wk., 8am - 5pm, \$40,000/yr. Develop computer software application systems in a client/server environment utilizing VMS, UNIX, C, TCP/IP and DECnsr. Prepare C, TCP/IP and DECnsr. Prepare program specifications and test data. Carry out unit and system testing and assist in technical documentation. Reqr. Bachelor's degree in Computer Science, Electrical Engineering, 2 yrs. axpr. in job offered or 2 yrs. axpr. as Technical Analyst/Programmer, Software Engineer. Expr. in development of computer software application systems utilizing VMS, UNIX, C, TCP/IP and DECnsr. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ava., Rm. 415, Detroit, Mi 48202. Raf. No: 12094.

Applications Programmer (Houston, TX area client site)

Develop, code, test, maintain,

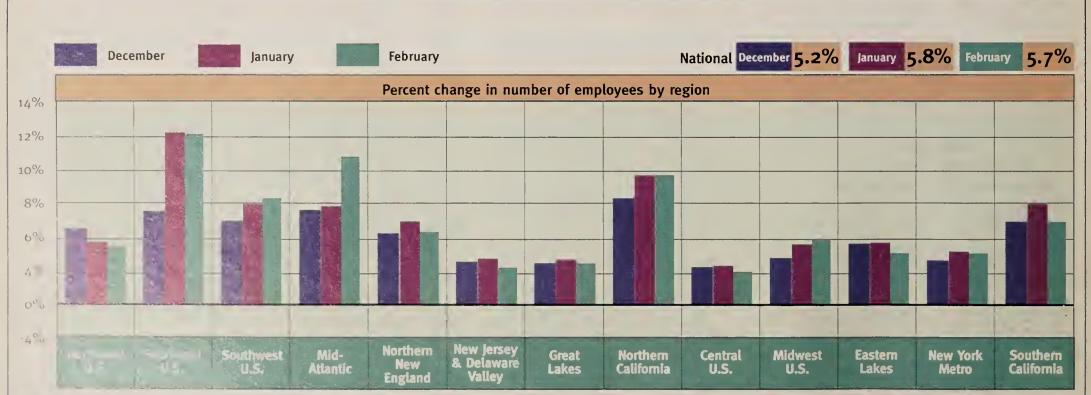
and document financial and

PROGRAMMER/ANALYST: 40 hrs./wk., 8am-5pm, \$39,900/yr. An-alyza, design and develop main-frame-based computer s/w systems frame-based computer s/w systems for manufacturing applications on IBM 3090 mnfrms, utilizing COBOL, CICS and DB2. Assist in preparation of high-level design specifications. Assist in formulating strategies for system development, testing, implementation and post-implementation. Regr. Bachelor's degree in Computer Science, Electrical or Mechanical Engineering. 2 vrs. expr. Mechanical Engineering, 2 yrs. expr. in job offered or 2 yrs. expr. as Sys-tems Analyst/Programmer. Expr. in design & development of computer sky application systems on iBM 3090 mnfrms utilizing COBOL, CICS and DB2. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 11894.

 AGS = AIC + AMGEN + AT&T + Arizona Department of Transportation = Abacus Consultants Adept \* Aerotek \* Aetna \* Alamo Rent-A-Car \* Alaska Airlines \* Alco Health Services \* Aldus · Allied Signal · Amdahl · American Management Systems · American Airlines · American Cyanamid . American Express. America Heart Association. American List Council. American Red Cross . Ameritech Information Systems . Amway . Anatec . Andersen Consulting . Apple Computer . Atlanta High Tech Career Fair . Ball State University . Bank of America · Barnett Technologies · Baxter Healthcare · Bell South · Bentley College · Blue Cross/ Blue Shield # Booz Allen Hamilton \* Brannon & Tully \* Bridgestone Software \* Broadway & Seymour \* Brown Brothers Harriman \* Broyhill Furniture \* CAP Gemini America \* CPU \* CSC Partners \* Computer Task Group \* Capricorn Systems \* Career Fair Coordinators \* Carolina Power & Light • Cellular One • Central Maine Power • Charles Schwab • Chicago Board of Trade \* Ciber \* Circuit City \* Citicorp \* Claremont Consulting \* Coca-Cola \* Comdisco \* Computer Horizons • Computerworld • Compuware • Coopers & Lybrand • Coors Brewing • Covia/United Airlines \* Crav Research \* D&B Software \* DHL \* Deloitte & Touche \* Digital \* Dow Jones \* Dun & Bradstreet \* E-Systems \* EDS \* ESPN \* Eckerd Drug \* Eddie Bauer \* Eli Lilly \* Emery Worldwide \* Equifax \* Ernst & Young \* Esprit Systems \* Executive Life \* Federal Express • Federal Reserve Bank • Fidelity Investments • First Chicago • Florida Power & Light • G Heileman Brewing • GE Consulting • GLAXO • GTE • Gallo Winery • Gartner Group General Mills
 Guifstream Aerospace
 HBO
 Harris
 Hayes Microcomputer
 Heidrick Struggles . Hewlett-Packard . Hill & Knowlton . Holiday Inn . Hyatt Technical Center . IBM . Informix « Ingres » Intel » Interactive Business Systems » Intergraph » Interleaf » Internet » Intuit \* Johnson Controls \* Kaiser Permanente \* Keane \* Kemper \* Knowledgeware \* Legent Logica \* Lotus \* MIT \* Marriott \* Mastercard International \* Maybelline \* Melita \* Mellon Bank \* Memorex \* Metropolitan Life \* MicroFocus \* Microsoft \* Morgan Stanley \* Nationsbank \* National Computer Associates \* National Education Training Group \* Nellie Mae \* Nestle \* Nike \* Nissan \* Northern Trust \* Northrop \* Novell \* Oracle \* Packard-Bell \* Perot Systems • Powersoft • Price Waterhouse • Primerica • QVC Network • RRA Rohn Rogers Consulting \* Racal Milgo \* Reader's Digest \* Reed Reference Publishing \* Reuters \* Reynolds Metals \* Riyad Bank \* Roadway \* Robert Half International \* Rubbermaid \* Safeco \* Sears Technology Services \* Sequent \* Service Merchandise \* Siemens \* Silicon Graphics \* Software 2000 . Software AG . Sony . Southwest Airlines . Sprint . Staples . Sterling Software . Storagetek \* Sun Microsystems \* Sunkist Growers \* Swiss Bank \* Sybase Synon \* Systemhouse \* TASC \* TRW \* Tandem \* The Limited \* The Los Angeles Times \* The Registry \* Timberland \* Toshiba \* Toyota \* Tufts Health Plans \* Tupperware \* UNISYS \* US Air \* US Robotics \* USAA \* United Airlines \* United Parcel Service \* Uplohn \* Vanguard \* Viacom \* Virginia Lottery . Walt Disney World . Wang Laboratories . Warner Bros . Waste Management \* Wells Fargo Bank \* WordPerfect \* AGS \* AIC \* AMGEN \* AT&T \* Arizona Department of Transportation \* Abacus Consultants \* Adept \* Aerotek \* Aetna \* Alamo Rent-A-Car \* Alaska Airlines \* Alco Health Services \* Aldus \* Allied Signal \* Amdahl \* American Management Systems \* American Airlines \* American Cyenamid **\*** American Express **\* A**mericn Heart Association . American List Council . American Red Cross . Ameritech Information Systems . Amway Anatec Andersen Consulting
 Apple Computer
 Atlanta High Tech Career Fair
 Ball State University \* Bank of America \* Sarnett Technologies \* Baxter Healthcare \* Bell South \* Bentley College \* Blue Cross/Blue Shield \* Booz Allen Hamilton \* Brannon & Tully \* Bridgestone Software \* Broadway & Seymour \* Brown Brothers Harriman \* Broyhill Furniture \* CAP Gemini America . CPU . CSC Partners . Computer Task Group . Capricom Systems . Career Fair Coordinators . Carolina Power & Light . Cellular One . Central Maine Power . Charles Schwab . Chicago Board of Trade . Ciber . Circuit City . Citicorp . Claremont Consulting . Coca-Cola \* Comdisco \* Computer Horizons \* Computerworld \* Compuware \* Coopers & Lybrand • Coors Brewing • Covia/United Airlines • Cray Research • D&B Software • DHL • Deloitte & Touche \* Digital \* Dow Jones \* Dun & Bradstreet \* E-Systems \* EDS \* ESPN \* Eckerd Drug \* Eddie Bauer \* Eli Lilly \* Emery Worldwide \* Equitax \* Ernst & Young \* Esprit Systems \* Executive Life = Federal Express = Federal Reserve Bank \* Fidelity Investments \*

America's Leading Corporations Advertise Their IS Positions in Computerworld. Shouldn't You?

# Computerworld/CorpTech Career Index



Copyright 1993, Corporate Technology Information Services, Inc., Woburn, Mass.

#### INTERNATIONAL **TAX FREE OPPORTUNITIES**

#### SENIOR SYSTEMS CONSULTANTS

System professionals with solid experience using: IMS/DB/DC, DB2, JCL, MVS, TELON & COBOL II required. Knowledge of Knowledge-ware products, ADW, Fore-sight, XDB, ENDEVOR, desir-able.

OOP, EDI, Imaging, CD-ROM & client server technology & training experience useful.

Also positions for Oracle DBMS and LAN designers with Powerbuilder experience. Excellent tax free salaries, va-cations, housing, medical and transport allowances.

Openings are immediate so fax or mail your resume today to:



2401 Fountainview #910 Houston, Texas 77057 Fax:(713) 977-1168 Tel:(713) 977-1167

System Architect, 40hrs/wk., 9am - 5pm, \$53,572/year. Analyze, design, develop and test customized information systems for business clients. Conduct requirements analysis and prepare documentation using Structured Analysis methodology. Development & prototyping using CASE tools. Write applications for both batch and online modes. Software debugging. User training. Tools: COBOL; C; ASSEMBLER; CICS; INTERTEST; iBM mainframe; PC/AT. B.S. in Computer Science or Electrical Engineering as well as two years experience as a System Architect or Programmer/Analyst required. Previous 2 years experience must include: COBOL; CICS; INTERTEST or EZTEST; IBM mainframe; development & prototyping using CASE tools; user training; PC/AT. Must have proof of legal authority to work permanently in the U.S. send two coplee of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Dennis Jones, Reference #V-IL-11608-O. NO CALLS. An Employer Paid Ad.

# **SOFTWARE "WIZARDS"**

Startup Opportunity

Mission Critical Software, a well-financed, Houston-based software startup company, must expand its staff (currently 25 people) to achieve its goal of World Domination (of the Enterprise Storage Management market—hey, it's a start). We have an immediate need for the following people to join our team:

- a brilliant and intense SENIOR PC/LAN "C" PROGRAMMER We need someone who is the best and brightest in the industry. A programmer who not only walks on water, but ionizes it as he or she passes. Someone who knows 'C' better than Kernighan and Ritchie.
- · a brilliant and artistic SENIOR GUI PROGRAMMER We need the Michaelangelo of Windows, the Vincent Van Gogh of Visual C++, the Mozart of menus, the Goethe of GUI, the ... well, you get the idea.
- a brilliant and sadistic SOFTWARE TESTER Are you a 'C' programmer who turned down a promising career with the KGB in order to go into software? Here is your chance to torture some code until it confesses (the location of its bugs).
- · a brilliant and charming TECHNICAL SUPPORT ENGINEER You're a great 'C' programmer, but lately you've started to develop...a personality. There are days when you would rather talk to people than search for undocumented APIs. What to do? Consider a move into technical support.
- a brilliant and relentless MARKETING PRODUCT MANAGER Today, there are many software companies in the Enterprise Storage Management market space. Your job will be to correct this unfortunate state of affairs. In the end, there can be only one.

We are looking for capability, not credentials. We want people who:

- · are intellectually incandescent, relentless in applying their considerable talents, and comfortable working in an unstructured environment
- · truly love to develop, test, support, and/or market systems software (computers are your life)
- · want to work for a software vendor

For these special individuals, we offer the opportunity to work with other highbandwidth software professionals in a smoke-free, suit-free, and politics-free environment. For immediate consideration for these historic opportunities, please mail, FAX or E-mail something about yourself, including your SAT, ACT, and/or GRE scores (no kidding, we need these) and your current salary, to our

# MISSION CRITICAL SOFTWARE, INC.

C/O: EDP PERSONNEL

5005 Woodway Drive, Suite 210, Houston, TX 77056 FAX: 713–629-1106 CompuServe: 72066,2264 INTERNET: 72066.2264@compuserve.com

Looking For A Window Of

Opportunity?

Technology Consulting, Inc. is a dynamic and rapidly growing Software

Development Firm with challenging assignments. We are a leader in out-

sourcing. Current client projects and our regional development center

CLIENT SERVER-C,C++, Smalltalk, Visual Basic/C++, MS/Access, Oracle, SQL + FORMS, Sybase, Powerbuilder, Lotus Notes, Gupta, SQL

MAINFRAME-CICS, IMS DB/DC, DB2, APS, Teion, Natural, Construct,

TCI offers competitive salaries, attractive benefits, and relocation assistance. For consideration, send resume or call: 502-589-3110.

TECHNOLOGY CONSULTING INC.

require the following skills:

Documerge, Lifecom, ALC, EDI

TANDEM, BANCSTAR

Windows, Foxpro, Clipper, Pathworks

Data Modeling/Warehousing, Decision

AS/400-RPG/400, COBOL/ 400, Synon

PLEASE DO NOT TELEPHONE OR VISIT US

# CLIENT/SERVER DEVELOPMENT

DSC is hiring far lang term projects now! Development experience and a complement of several technologies below is preferred. UNIX, POWERBUILDER, and SYBASE ore highly saught. If you have a strong desire to ochieve in a service oriented company, on an independent or full time basis, we would like to talk to youl

- RPG 400 SYNON WINDOWS
- VISUAL BASIC • C/C++
  • POWERBUILDER
- INFORMIX • TCP/IP • AIX

Competitive salarles and benefits For more information fax or mail your resume to:

• ORACLE



1077 Celestial Street Bldg. 2, Suite 100 Cincinnati, Ohia 45202 Fax 513-721-8844

Our apenings Are Immediatel

# **PROCESSING** Contrect & Permenent Jobs:

- Powerbuilder / Smelitelk
  ORACLE / INFORMIX
  EDI Jeny pletform)
  C/C++ / UNIX/OS/2
  WINDOWS SDK / MOTIF
  VISUAL BASIC
  IBM DB2 / DECForms
  Fex or send your resume to:

  PROTECH SYSTEMS
- PROTECH SYSTEMS GROUP, INC. 5545 Murray Roed, Suite 300 Memphis, TN 38119 800-459-5100

Great Consulting Assignments and Full Time Opportunities Please send resume & call Mimi Simon Assoc. 90 West St., Suite 1105, NYC 10006

SHOULD CONSULT

(212) 406-1705 FAX (212)406-1768

# **LEADING EDGE OPPORTUNITIES**

Entergy, one of the nation's largest electric energy companies and a leader in the utilization of evolving technologies, is currently seeking world class information technology professionals experienced in UNIX and data base administration.

# **UNIX System Administration**

Will support open systems platforms. The candidate will be responsible for both hardware and operating systems maintenance, and day-to-day operations of a variety of primarily UNIX computer systems, used as SYBASE/ ORACLE servers and application program development platforms. System Automation, performance monitoring and tuning, as well as backup/ recovery and disaster recovery procedures will be part of the candidate's responsibilities. The candidate will also participate in the development of policies and procedures for a distributed environment.

Ideal candidate will possess a technical degree and have five plus years' experience in UNIX system administration. Networking, TCP/IP, MS-DOS TCP/IP clients, strong troubleshooting and problem isolation skills at the operation level a plus. Hands-on experience with at least two of the following platforms: Sun Microsystems with Solaris 2.X, IBM RS6000 with AIX, HP 9000 with HP/UX, or UNIX System V Release 4 is required. Ability to program with at least two of the following: C, PERL, SH, KSH, SQL, SED, or AWK is also required.

# **Data Base Administration**

Will support multiple SYBASE and ORACLE production environments. The candidate will be responsible for control block generation, data base performance monitoring and tuning, logical and physical data base design, data base integrity verification, and recovery procedures for both DBMS systems. The candidate will also participate in the development of policies and procedures for a distributed data base environment.

Ideal candidate will possess a technical degree and have three plus years' experience in data base administration. Experience in one of the two RDBMSs is required. IMS or DB2 experience a plus.

Entergy's current environment consists of three IBM mainframes supporting production applications in IMS DB/DC and CICS/DB2, and numerous UNIXbased systems supporting production applications in SYBASE and ORACLE. Future applications will be developed in a distributed architecture.

The benefits of working for our multi-billion dollar organization include excellent compensation and benefits programs including paid relocation and incentive pay plans. If you are up to the challenge of remaining on the edge of technology, send or FAX your resume, including salary history, to: Entergy Services, Inc., Human Resources, P.O. Box 61000, New Orleans, IA 70161; FAX: 504-569-4428. An Equal Opportunity Employer, M/F/D/V



# Growing demand has created opportunities in the Carolinas for consultants & especially trainers with at least 2 years ex-perience in the following areas:

**PowerBuilder** C, C++, Visual Basic **Business Process** Design

SYBASE/SQL Server

We want experts who desire to join a learning organization where the people are focused and enjoy their work! As an authorized training center for Microsoft, Powersoft, Action Workflow, Lotus, etc., we provide growth both professionally and technically. Send your resume in confidence to:

The Database Group 11 Technology Circle Columbia, SC 29203 Fax: (803) 935-1111

# **PROGRAMMERS**

Over 60 Current Openings Nationwide for all programming skills. Urgent needs for any of these unique skills:

\* Oracle, many needs \* RDB + Vax

\* Powerbuilder \* Sybase, many needs

\* Cobol + Cobol II \* CICS

\* O/S 2 \* Windows NT \* Foxpro + Clipper

\* IDMS \* client/server expert \* Insurance applic. \* MSA Gen.Ledger

\* Telephony ATM \* Unix internals \* Visual Basic

\* BAL \* OS/JCL \* OS/MVS \* AS400 \* VSAM

\* Easel

\* SQL

\* PL/1

\* RPG

\* Genesis

\* TSO/SPF

\* DB2 \* ADA \* C, C++ \* DBA

# **TechniSource**

1901 NW 62 St #401, Dept. CW3-94 Ft. Lauderdale FL 33309 305-493-8601/ 800-940-1111, Fax 305-493-8603 Chicago + Midwest: 800-330-3308 Orlando, FL: 800-940-9401 Tampa/St.Pete.: 800-940-2222 Cedar Rapids, IA: 319-373-2600

1800 Meidinger Tower, Louisville, KY 40202 FAX. 502-589-3107

# Marketplace

# Buy smart: BBS Software



By Joe Pancpinto

Experts have simple advice to start you on the road to buying your own

bulletin board system (BBS): Buy a modem, call a variety of services and get an idea of what's out there.

"Call a BBS in your industry or a bunch of local ones to get a feel for the software you like best," says Jack Rickard, editor of *BoardWatch*, a monthly magazine in Beach, Calif. Typically, the price varies upward as the number of lines supported grows.

The minimum price of the four top-selling BBS software packages (see chart) ranges from \$129 for Wildcat from Mustang Software, Inc. to \$295 for TBBS from ESoft, Inc. All run on DOS.

The following are several points on which to evaluate the packages:

Multitasking/multiuser. This refers to the architecture on which a particular

BBS package is built. Wildcat and PCBoard from Clark Development, Inc. are multitasking systems that support multiple users by essentially running multiple copies of the software.

For multitasking systems, the PC DOS platform must be outfitted with DesqView from QuarterDeck Systems, Inc. so that it can run multiple versions of the software. Even then, BBS

software built on multitasking architectures can support only eight simultaneous users per PC. In contrast, multiuser software, such as TBBS and The Major BBS from Galacticomm, Inc., can support more users per PC.

The advantage of multitasking BBS software is its low entryprice—less than \$170 for PCBoard and sometimes less than \$100 for Wildcat. The advantage of

multiuser BBS software is that it takes less hardware to support more users.

LAN log-ons. In addition to supporting dial-in users, a BBS package may support log-ons from users on a LAN. This is important if internal users are going to use the BBS, say for product support, and the company does not want to tie up a phone line. Currently, Wildcat, The Major BBS and PCBoard support LAN log-ons.

Interconnectivity. A company may want to provide users with messaging capabilities across other network platforms such as Fidonet (a BBS hobby network), the Internet and QWK (a format for off-line batch mail).

Each of the leading vendors supports all three forms of messaging internally

or through proprietary or third-party options.

Chat capabilities. All the major vendors support a chat function, which allows users to communicate synchronously. This feature is more important for hobby or recreational BBS than it is for commercial BBS.

A complete BBS setup includes a PC, modems, an intelligent multiport card to handle multiple phone lines, BBS software and a LAN card if users plan to log on from a LAN. An entire system can be built for between \$6,500 and \$10,000, Rickard says.

Panepinto is a free-lance writer in Amherst, Mass.

# Down the line

he most common mistake companies make is overestimating the number of lines they need to support a BBS. But there's help.

Two principals at ESoft have written books about BBS, the Internet and on-line uses of the PC. President Phil Becker's Introduction to

ternet and on-line uses of the PC. Predident Phil Becker's *Introduction to PC Communications* includes this formula: Number of lines = (hours per call) × (callers per period) ÷ (hours per period).

Hours per call is usually a fraction of an hour (15 minutes = 0.25 hour); callers per period = number of callers expected during the hours the BBS will be in operation (per day or week); hours per period = number of hours of operation (per day or week).

A company may expect 100 calls in an eight-hour day, with each call lasting 15 minutes. The equation for determining the number of lines it needs is  $0.25 \times 100 \div 8 = 3.125$ . This company needs three or four lines to support its expected BBS traffic.

Alan Bryant, director of marketing at ESoft, says he believes this formula is too generous. In his upcoming book, *Creating Successful Bulletin Board Systems*, he suggests taking the final number and dividing it in half.

"People tend to overestimate those numbers because they are usually guessing about callers per period and length of calls," Bryant says. Some rules of thumb: Chat calls average around 45 minutes, general-usage calls last about 15 minutes and calls for file-downloading will vary.

Jim Harrer, president of Mustang Software, suggests an easier way. Companies unsure of BBS traffic should set up a two-line system using the "hunt" service from the phone company.

If Line 1 is busy, the call gets forwarded to Line 2. Set up the two-line system and then monitor use of Line 2. If it is busy more than 50% of the time, the company should add another phone line.

—Joe Panepinto

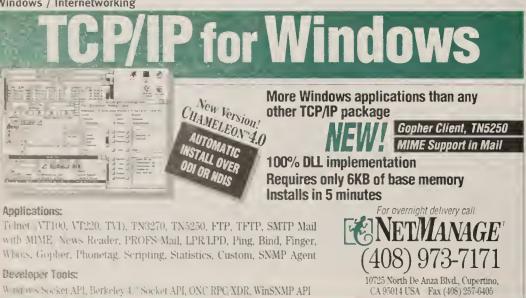


Littleton, Colo. Most packages handle menuing differently and therefore, "the best" is pretty much a matter of opinion. Thus, the more interfaces you see, the

better-informed you will be.

BBSs support a number of platforms, with the majority running on DOS. Minimum prices range from free to \$2,000 for Teamate, a Unix-based product from MMB Development Corp. in Manhattan

Windows / Internetworking



Optical Storage



Large Systems Buy Sell Lease

# **Dempsey: Where IBM® Quality Is Second Nature!**

- RS/6000
- AS/400
  - SERIES/1
  - ES/9000
    - PS/2, VP & IND. PC

# Sales & Rentals

- Processors
- Peripherals
- Upgrades



18377 8each Bivd., Suite 323 • Hungtington 8each, CA 92648 (714) 847-8486 • FAX (714) 847-3149

Dempsey

Call Today for Pretested Equipment, Technical Assistance & Overnight Shipping!

(800) 888-2000

Time / Services

# **Most Vendors** have well-equipped data centers...

They have large systems with the software you need, plenty of MIPS, and

#### **ONLY ONE WILL EXCEED YOUR EXPECTATIONS!**

- > Only one runs your work as its own.
- > Only one minimizes your risk and maximizes your cash flow.
- Only one will get the job done totally.

CSC CompuSource – dedicated to outsourcing since 1980.

You're in control when you put us IN CONTROL!

CSC CompuSource

A Unit of Computer Sciences Corporation

110 MacKenan Drive Cary, North Carolina 27511 919.481.9341

Outsourcing / Time Sharing

# ALICOMP, INC

The "Boutique" of the Computer Services World

Outsourcing

New & Used

**Timesharing** 

VM, MVS, VSE Remote and On Site

Two State of the Art Locations:

105,000 sq. ft. Secaucus, NJ complex 20,000 sq. ft. Manhattan complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Computers

Peripherals

Upgrades

Buy · Sell · Rent · Lease

Large Systems Computer & Perpherals

• SERIES/1

AS/400

• RS/6000

• SYSTEM/88

..and more!

SPECTRA (800) 745-1233

(714) 970-7000 (714) 970-7095 Fax

Anaheim Corporate Center 5101 E. La Palma Ave., Second Floor Anaheim, CA 92807

amdahl Data General digitai

HEWLETT PACKARD

HDS

Prime Stratus

**Sun** TANDEM

**UNISYS** 

**XEROX** 

Bright color. Bright price.

The BOXLIGHT 1280 ColorShow Special.



The BOXLIGHT 1280 True Color Projection Panel. At \$300 off, it's an unbeatable value.

- Brightest image
- Compact & portable
- PC & Mac
- FREE remote & cable

- The projection panel specialists
- More than 50 models in stock
- Instant availability
- Overnight shipping ♦ 30-day guarantee
- Technical support hotline

# **BOXLIGHT:** Your direct source for all the bright answers.

No one else offers the one-stop shopping...the selection... the value...the immediate delivery...and the knowledgeable service and support you get from the projection panel





Call today 1-800-762-5757

**Buy Sell Lease** 

# ME BUY

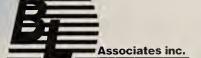
HP 9000

and we sell it **Data General** 

**RS/6000** 

too!

**Data Products** 



**PC's Workstations** 

17) 982-966 Fax (617) 871-4456

Outsourcing

# If Outsourcing is your objective ...

You can maximize your information technology investment by outsourcing part - or all - of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.



®The Outsourcing Group

A Unit of American Software USA 470 E. Paces Ferry Road Atlanta, GA 30305 404-264-5770

Time / Services



**Extensive Software Library** 

Telenet Tymnet Searsnet IBM Information Network

Extraordinary Customer Service Migration Management

FANEUIL SYSTEMS

708-574-3636 New England 617-595-8000 815 Commerce Drive, Oak Brook, IL 60521 MVS/ESA VM/ESA /SE/ESA /IS/DBDC CICS **TSO** 

**ICCF** 

# Computerworld's **Upcoming March/April Editorial Features**

# April 4:

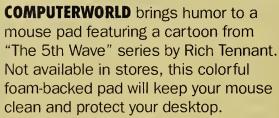
Personal Productivity Software

April 11:

NTvs.OS/2 vs. Unix

# **COMPUTERWORLD's**

"5th Wave" Cartoon Mouse Pad



your name, address and check or money order to COMPUTERWORLD, P.O. Box 9171, Framingham, MA 01701, Attn: Product Fulfillment.

<sup>1</sup>In U.S., for each unit ordered, add \$1.25 for postage and handling; orders outside U.S. add \$2.50 each. Residents of MA, CA, GA, NJ, and DC add applicable sales tax. Canada residents add G.S.T.

Best of all, it's only \$4.99\*. Send

For credit card orders, call 1-800-343-6474.

# Bid / Proposals

# MS CENTRAL DATA PROCESSING AUTHORITY

COMPUTERWORLD

Sealed proposals will be received by CDPA, 301 N Lamar St., 301 Bldg, Suite 508, Jackson, MS 39201 for the following

RFP 2579 due Thursday, April 28, 1994 @ 3.30 P.M. for the acquisition of the hardware, soft-ware, and services required for the turnkey implementation of PC-based local area networks for the Jackson office and the nine district offices of the Mississippi State Tax Commission \$10 Charge Vendois are encouraged to attend a bidder's conference to be held on Thursday, April 14 1994 @ 10:00 A.M. in the 12th those conference.

RFP 2578 due Tuesday, April 26, 1994 @ 3:30 P M for the acquisition of an upgrade to an existing IBM AS/400 computer for the Mississippi Department of Finance and Administration. No Charge

Administration. No Charge
Written requests required for RFP's with a charge Acceptable forms of payment are a corporate check on a MS bank, a certified check or a Postal money order made out to CDPA and mailed to the above addiess. To request RFPs with no charge, call Linda Watkins @ 601.359–2604. CDPA reserves the right to reject any/all bids and to waive informalities.

# **Used Equipment**

# MOTOROLA HAS TANDEM CYCLONE COMPUTERS FOR SALE

Motorola is closing a data network . If has available for sale two operiting Cy one professirs O e is e atai Sitai nbuig IL and will be as it e Sec ei bir the other co process in Allington, VA and will h v I N , 2ct have been 1 A se insta s and Affinding

TOTAL NO THE STATE OF THE STATE

# Used / Lease / Rent

# FOR SALE

BUY OUT OF HOSPITAL PERMITS SALE OF THE FOLLOWING NEARLY NEW COMPUTER EQUIPMENT (USED 5 MONTHS):

- EA HP9000 MODEL 887S Computer Sys
- 1. EA HP9000 MOOEL 867S Computer Sys 1. EA OEC MICRO VAX 3100/Model 80 Computer Sys
- 232 EA HP CRT MODEL 700-60 Misc. Intermed Barcode Readers, Laser
- 1. EA Western Star Blood Bank Hardware Configuration

Send your FAX to (816) 521-3099 for complete equipment configuration Irsting and/or

# Bid / Proposals

FISA IS LOOKING TO DO BUSINESS WITH YOUR COMPANY;

The New York City Financial Information Services Agency wants to add to its vendor lists for DP goods and services. Interested? Write to FISA at 111 8th Ave. New York, NY 10011; attn: Ms. Millie Nieves

# Bid / Proposals

Sealed bids will be received in the Office of the Oirector of Procurement and Contracts. Mississippi State University, Post Office Box 5307, Mississippi State, MS 39762, for the purchase of the following. Bid No To Open Tuesday

April 19, 1994 - 2:00 P M 94-97 UPGRADE UNIX COMPUTER SYS 94- 1001 COMPUTER SERVER & PORTS 94- 101COMPUTER CHASIS, POWER

SUPPLY MODEMS, FAN TRAY Specifications may by obtained from the Office of the Oirector of Procurement and C tracts Mississippi State University
Pist Office Box 5307 Mississippi State. MS 39762 upon request Right is hereby B Wayne Reed

**Advertisers** Have One **Important** Thing in Common: Computerworld Marketplace

Successful

1-800-343-6474, ext 744

# **COMPUTERWORLD** Marketplace

Reach more buyers by stretching your ad budget with our charter rates! Your Computerworld Marketplace Account Executive has all the colorful details—call today



Montana Nebraska New Mexico North Dakota South Dakota Texas Utah Wisconsin

Manitoba Saskatchewan

Kansas Kentucky Louisianá Mississippi Missouri North Carolina

Oklahoma South Carolina Wyoming Tennessee Virginia West Virginia

Maine Massachusetts New Hampshire New York Rhode Island Vermont

> New Brunswick Newfoundland Ontario Quebec

Oregon Washington

British Columbia

Southwest Claude Garbarino Arizona

Nevada Southern California Mid Atlantic Michelle Reeves

Delaware Maryland Michigan New Jersey New York City Long Island

Pennsylvania Washington D.C

# Successful Advertisers Have One Important Thing in Common: Computerworld Marketplace

"...We experience a higher rate of closure with leads generated by **Computerworld Marketplace than with** leads from any other source"

Luis Navarro Vice President/Sales Faneuil Systems

"...Proven results are our first and foremost reason for advertising in Computerworld Marketplace. Every week."

David Rousso President Executive Infosource

With Computerworld Marketplace every week, quality leads and bottom-line results can spell advertising success for you, too. So Call today - and be sure to ask about our four color charter rates!

# COMPUTERWORLD Marketplace

1-800-343-6474, ext 744

# 4GL

CompuSoive Associates River Edge, NJ	. (800) 847-8583
ACCTG SOFTWARE/	SERVICES

## Management Information Consulting, Inc.

OPEN SYSTEMS® Accounting Software
Open Systems Holdings Corp. . . . . . (800) 328-2276

# **ACQUISITIONS - PUBLIC CO.**

Looks to acquire contract programming companies. Call confidentially . . . . . . . . . . . . (516) 437-3302

# APPLICATIONS CONVERSION

Forecross Corporation
San Francisco, CA . . . . . . . . . . . . . . . . . (415) 543-1515

# APPLICATIONS DEVELOPMENT

CompuSoive Associates River Edge, NJ . . . . . . . . . . . (800) 847-8583 PC/LAN Database Application Development Envision Development . . . . . . . . . . . . . . . . . (508) 443-0829

Impact Solutions, Inc., PC or Mac, Nationwide Foxpro, Omnis, 4D Server . . . . . . (800) 858-8330

Information Technologists, Inc. (800) 298-4800 Client Server, Applications & GUI Development

Micro Focus COBOL/CICS/XDB SilverStone Systems, Inc. NY . . . (212) 788-4079

**RESOURCE SOLUTIONS (800) 825-8884** CASEBASE V.4 makes application development selection or "shortlisting" a snap. 600+ products. Resource tool of choice for 5,000 developers on 4 continents. \$195 (1yr) or \$295 (2yr). 6050 Peachtree Parkway, Suite 340-228, Norcoss, GA 30092

SYNTEL, Inc.

NATIONWIDE .....(313) 828-3290 Planet Data/Paradox Windows Programming Moriches, New York......(518) 878-6803

# CABLING SERVICES

Nationwide, 250+ Local Service Locations Premises One LAN SERV . . . . . . (800) LAN-SERV

# CLIENT SERVER DEVELOPERS

Downsizing from mainframe to Client/Server? Or, converting from one platform to another? Call the DBMS specialists. No job too small. Superior quality at great prices. Money back guarantee.

PC/LAN Database Application Development Envision Development . . . . . . . . . . . . . . . . . . (508) 443-0829

Information Technologists, Inc. (800) 298-4800 Client Server, Applications & GUI Development

NetLinks Technology, inc.:CORBA,OOAD C++, client/server apps . . . . . . (803) 891-4177

NIIT - Software Division . . . . (404) 804-8448 Developers of client server applications using Sybase and Oracle. Option for offshore software development available. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax: (404) 804-

PowerCerv (PowerBuilder Specialists) Tsmps, FL (9 branch offices) . . . (813) 228-2378

SYNTEL, Inc. NATIONWIDE .....(313) 828-3290

# Stamford, CT . . . . . . . . . . . . . . . . (203) 359-9807 COMPRESSION/CROSS

**PLATFORM** Adlersparre & Assoc Consulting 413-296-0252 MVS,VM,PC DOS,OS/2,UNIX,AS/400

# CONSULTANTS

ADW & IEF & PowerBuilder Analyses & Design Bridgton Consulting . . . . . . . . (404) 933-8992

#### **CONTRACT PROGRAMMING**

For your every computing need... We are a storehouse of talent in ORACLE 7.0, SYBASE, POWERBUILDER, UNIFACE, IBM (CICS, DB2, VSAM, COBOL), UNIX, WINDOWS, C, C++ Call us at (817) 270-4848.

Hexaware infosystems Ltd.

INFORMIX/ORACLE/SYBASE/UNIX ACJ & Associates . . . . . . . . (800) 284-8888

Oracle/C/Cobol/Unix/Forte/OO - I.S. Consultants Minneapolis, MN .....(612) 851-9544

Information Technologists, Inc. (800) 298-4800 Client Server, Applications & GUI Development

AS/400, RISC 8000, SERIES 1 L.S.J. Consulting, Inc. . . . . . . . (214) 215-1837

Micro Focus COBOL/CICS/XDB SilverStone Systems, Inc. NY .....(212) 786-4079

NATIONWIDE .....(313) 828-3290

# **DATA CONVERSION**

Data Conversion, Inc. Minneapolis, MN . . . . . . . . . . . . (800) 927-0677

#### **DBMS**

(800) 982-4377
Document DATABASE Tool for the Professionals.

We have VAR and Dist. programs available. Call/ Write 15 Main St. Kingston, NJ 08528.

CompuSoive Associates
River Edge, NJ . . . . . . . . . . . . . . . . . (800) 847-8583

# **DISASTER RECOVERY**

Remote SHADOW® for OpenVMS Advanced Systems Concepts, Inc. . . . . (800) 229-2724

CHI/COR Information Management, Inc.

(312) 322-0150 Recovery Planning Made Easy. PC software tools guide network, data center, and business unit planning. Includes complete methodology to teach novices recovery planning concepts and relational database for easy planning. MS-Windows and LANL agree titles. dows and LAN compatible.

Raymond Professional Management, Inc. Roswell, GA . . . . . . . . . . . . . . . . . (404) 587-4090

Recovery Management, Inc. REXSYS® Software.....(800) RMI-8888

Strohl Systems LDRPS Software ......(800) 834-2018

# DISTRIB. OBJECT COMPUTING

NetLinks Technology, Inc:CORBA,OOAD, C++,client/server apps.....(603) 891-4177

# DOCUMENTATION

Eden Communications, Inc. New York, NY .....(212) 489-2450

# **EDUCATION & TRAINING**

Object-Oriented Analysis & Design Training aLigra Systems .....(800) 347-8903

(508) 835-9819 IS Training Services Specializing in technical and non-technical training solutions and educational consulting services designed to support the entire IS function - including the clients of IS. 40+ years of experience! Contact BoyTan & Associates, 5 Old Meadow Lane, Acton, MA 01720.

Skill Dynamics, An IBM Company
A full service training company that specializes in technical and business training, consulting, outsourcing and customized offerings. Call 1800 IBM-TEACh for a free catalog.

Information Technologists, Inc. (800) 298-4800

LEARN C++ ONLINE: Instructor-led! Experiential format teaches basic C++. Participants com-plete a variety of tasks checking both conceptual & practical understanding and interact in teams to produce an automated library. Contact ISIM, 1-800-441-ISIM, Box 470640, Aurora, CO 80047.

LAKEVIEW TECHNOLOGY INC. Instructor-led AS/400 education ..... (800) 962-4081 Sybase, SQL Server Training

Larson Software . . . . . . . . . . . . . . . . (800) 394-7966

NIIT - Training Division . . . . . (404) 804-8446 Developers of custom Computer Based Training (CBT), Multimedia, and Performance Support Systems. Development site is ISO-9001 certified. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax (404) 804-6445.

Object Oriented Preparation Services, Inc. Robbinsville, NJ . . . . . . . . . (609) 259-0601

# **ELECT. DATA INTERCHANGE**

Impact Int'l Technologies, Inc.
Princeton, NJ ......(809) 734-7411

# **EXECUTIVE INFO. SYSTEMS**

XENOS Corporation Dallas, TX .....(214) 869-9860

#### **FAX-ON-DEMAND**

"HOW TO PROFIT FROM FAX-ON-DEMAND"

Discover the power of automatic fax delivery of information for your organization. Get this manager's guide for only \$29.95. For Table of Contents by fax, call 408-243-2275, request document

**ABConsultants** 

(800) 982-3715

# **FOCUS**

FOCAL SYSTEMS, INC.: Focus Consulting Seattle, WA ......(206) 788-4467

# **GEOGRAPHIC INFO. SYSTEMS**

Cellper Corporation Newton, MA . . . . . . . . . . . . . (817) 527-4700

# **GROUP WARE/E-MAIL**

Informetion Technologists, Inc. (800) 298-4800 Client Server, Applications & GUI Development

# **HELP DESK**

PowerCerv (PowerBullder Application) Tampa, FL .....(813) 228-2378

# **HUMAN RESOURCE S/W**

SPECTRUM Human Resource Systems Corporation Denver, CO . . . . . . . . . . . . . . . . (800) 334-5660

# **HUMAN RESOURCE SYSTEMS**

Ceridlan Employer Services
Repertoire and HR-1 HRIS . . . . . (800) 729-7855

# **IMAGING**

Document Mgt, Workflow for AS/400 Acknowledge Inc. . . . . . . . . . . . (800) 533-1776 ISO 9000 Doc. Mgmt. Systems OXKO Corporation . . . . . . . . . . . . . (410) 224-3314

# MANUFACTURING SOFTWARE

ROI Systems, Inc.-MANAGE 2000 Product Minneapolis, MN 55426 . . . . . . . . . (800) 544-7849 Intrepid Software, Inc. PowerCerv (PowerBullder/Sybase Application)
Tampa, FL . . . . . . . . . . . . . . . (813) 228-2378

# MARKETING INFO. SYSTEMS

Advanced Marketing Solutions, Inc. Shelton, CT . . . . . . . . . . . . . . . . (203) 925-3038 PowerCerv (PowerBuilder Application) Tampa, FL ......(813) 228-2378

# MICROFILM/MICROFICHE

COLD, Direct Attach for AS/400 Acknowledge Inc. . . . . . . . . . . . . . (800) 533-1776

# **NEWTON CONSULTING**

(617) 247-7668 Custom Newton Products and Solutions

# **OBJECT CLASS LIBRARY**

PowerCerv (PowerBuilder Object Library)
Tampa, FL ......(813) 228-2378

# OBJECT ORIENTED DEV

OOA/OOD/Forte trained OO Development I.S. Consultants . . . . . . . . . . . . . . . . . . (612) 851-9544 NATIONWIDE . . . . . . . . . . . . . . . . (313) 828-3290 R Systems, Inc., California . . . . (916) 631-1503 Quality Software Developed in India SAVE \$I

#### **OFFSHORE SOFTWARE DEV.**

We are organized to deliver... ORACLE, SYBASE, POWERBUILDER, UNIFACE, IBM/UNIX solutions. State-of-the-art software factory. Project references on request. Call us at (817) 270-4848.

Hexaware Infosystems Ltd.

Boston • Bahrain • Dammam • Bombay

#### **OFF-SITE SOFTWARE DEV.**

Computer Utilization Services Corp. Birmingham, AL....(205) 933-0555

#### **OUTSOURCING**

Advanced Deta Management (800) 824-3772 A full service system integrator. Design through Implementation, all major databases and tools. Call/Write 15 Main St. Kingston, NJ 08528.

**OUTSOURCING/REMOTE COMPUTING** 

Let a company with 26 years of experience help you make the right outsourcing decisions! We are a nationwide cconsultant who will guide your assessment and vendor selection. We locate ser-

ALL platforms.

COMPUTER RESERVES, INC.
(800) 882-0988

MCRB Service Bureau, Inc. 3090 Computer . . . . . . . . . . (800) 941-MCRB SYNTEL, Inc.

NATIONWIDE . . . . . . . . . . . . . . . . . (313) 828-3290

# PAYROLL SYSTEMS

Ceridlan Employer Services Signature® P/R & Tax Filing . . . . (800) 729-7655 

# PROJECT MANAGEMENT

Pitagorsky Consulting/Training New York, NY . . . . . . . . . . . . . . . (212) 696-9687

# **PURCHASING SOFTWARE**

Commerce Software, Inc. (PurchaseSQL $_{\odot}$ ) Elmsford, NY . . . . . . . . . . . . (800) 447-7172 QPII@ PURCHASING MANAGEMENT SYSTEM Dynamic Software, Greer, SC . . . . . (800) 627-1218

# **RETAIL SYSTEMS**

L.S.J. Consulting, Inc. Dallas, TX . . . . . . . . . . . . . . . . . (214) 215-1837

# RIGHTSIZING

PC/LAN Database Application Development Envision Development . . . . . . . . . . . . . . . . . . (508) 443-0829 MCRB Service Bureau, Inc. 3090 Computer . . . . . . . . . (800) 941-MCRB

# SALES FORCE AUTOMATION

Scherrer Resources, Inc. (Sales Ally Software)
Philadelphia, PA 19118 . . . . . . . . . (800) 950-0190

# SECURITY

...(800) TO-JANUS JANUS Software . . MVS Security Audit Sftw & Info Security Cons RSH Consulting, Inc. Newton, MA .....(617) 969-9050 RACF/Systems . . . . . . . . . . . . . . . (914) 425-7758

# SECURITY/PHYSICAL

Z-Lock Manufacturing Co Redondo Beach, CA 90277 . . . . . . (310) 372-4842

# S/W INTERNATIONALIZATION

International Systems Design, Inc. S/W Lociztn/overseas distrib (415) 788-1812

# S/W QUALITY ASSURANCE

RESOURCE SOLUTIONS (800) 825-8684 SQABASE makes Quality Assurance software selection or "shortlisting" a snap. Developed for the Quality Assurance Institute (QAI). Members buy directly from QAI, \$135 US Funds. 6050 Peachtree Parkway, Suite 340-228, Norcoss, GA

# SPEECH INTEGRATION

Zeitech, Inc. Stamford, CT . . . . . (203) 359-9807

# Companies in this issue

# Page number refers to page on which story begins

	Du Pont Co.         1           Dunkin' Donuts, Inc.         30	Link Resources, Inc
dvanced Manufacturing	Dyna Communications	Loral Aerospace Corp.
esearch, Inc.		Lotus Development Corp 1,14,15,16
advanced Micro Devices, Inc	50	
ironet		M
Jamo Rent a Car		
Alberta Cancer Research Board		Magic Valley Regional
disa Systems, Inc.		Medical Center
undahl Corp		MainSoft Corp
		McCaw Cellular
merican Express Co1 merican Management	Entergy Corp	Communications, Inc
ystems Centerystems		McDonnell Douglas Corp.
merican Medical Association		MCI Communications Corp
merican Mobile Satellite		Merisel, Inc.
meritech Corp		Merrill Lynch & Co
moco Corp	19	Metricom
MR Corp		Microcom, Inc
MR Information Services		Microsoft Corp 1,4,12,14,15,16,30
ndersen Consulting 1,30,76,		49,51,55,78,80,
NR Pipeline Co		Mobile Telecommunication
on Specialty Group		Tcchnologies Corp
pple Computer, Inc		Motorola, Inc 12,76,77,78
rdis		
rtisoft, Inc.		N
SK Group, Inc.		NASDAQ
T&T		National Institute of Standards
T&T Global	Ford Motor Co	and Technology
nformation Solutions		National Institutes of Health
utoTester, Inc.	1	National Jewish Center for Immunology
utotime Corp		and Respiratory Medicine
valon Software, lnc		National Library of Medicine
	Fujitsu Ltd	NCube Corp
В		NetFrame Systems
anyan Systems, Inc 16,	G G	Network Specialists, Inc.
aruch College		Neuron Data, Inc
ell Atlantie Corp 76,		New Paradigm Software Corp
cllSouth Corp		New Science Associates, Inc.
erry Hill Software		New Signals Research
ICC		New York State Electric
lyth Software, Inc.		and Gas Corp
orland International, Inc 1,15,49,1		Next Computer, Inc. 24
rainstorm Technologies, Inc.		Northeast Utilities
sull HN Information	Greenwich Associates	Northwestern Mutual
ystems, Inc		Life Insurance
urroughs Corp		Nova Corp
		Novell, Inc
C	Н	Nynex Corp
abletron Systems, Inc.		0
alling Communications Com	12	
		Oakland University
ambar Software		
ambar Software28, arnegie Mellon University28,	Houston Chronicle	Object Management Group
ambar Software	51       Houston Chronicle	Open Software Foundation
ambar Software	51       Houston Chronicle	Open Software Foundation
ambar Software	51       Houston Chronicle	Open Software Foundation
ambar Software	51       Houston Chronicle	Open Software Foundation 1,30,49,55,59,78,
ambar Software	51       Houston Chronicle	Open Software Foundation
ambar Software	51 Houston Chronicle	Open Soltware Foundation
ambar Software	51 Houston Chronicle	Open Software Foundation
ambar Software	51       Houston Chronicle	Open Software Foundation
ambar Software	51       Houston Chronicle	Open Software Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       I2         52       Hughes LAN Systems, Inc.       52         35       I         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59	Open Software Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         35       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1n formation Builders, Inc.       110         1n formix Software, Inc.       55,59         Inline Software       45	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         35       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59         1nline Software       45         1nsurance Value-Added	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         35       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59         1nline Software       45         1nsurance Value-Added       Network Services       76,78	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       I2         52       Hughes LAN Systems, Inc.       52         35       I         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59         1nline Software       45         1nsurance Value-Added       Network Services       76,78         30       Integrated Systems	Open Soltware Foundation Oracle Corp
ambar Software arnegie Mellon University	51       Houston Chronicle       30         76       Hughes Corp       I2         52       Hughes LAN Systems, Inc.       52         35       I         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59         1nline Software       45         1nsurance Value-Added       Network Services       76,78         30       Integrated Systems       Solutions Corp.       1	Open Soltware Foundation Oracle Corp
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         35       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59         1nline Software       45         1nsurance Value-Added       Network Services       76,78         30       Integrated Systems       Solutions Corp.       1         112       Intel Corp.       24,48,62,78,80	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       I2         52       Hughes LAN Systems, Inc.       52         35       I         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1nformation Builders, Inc.       110         1nformix Software, Inc.       55,59         1nline Software       45         1nsurance Value-Added       Network Services       76,78         30       Integrated Systems       Solutions Corp.       1         31       Intel Corp.       24,48,62,78,80         10       International Data Corp.       59,75	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         53       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1a Information Builders, Inc.       110         1b Informix Software, Inc.       55,59         1a Insurance Value-Added       45         1b Integrated Systems       76,78         30 Integrated Systems       Solutions Corp.       1         1c Intel Corp.       24,48,62,78,80         1nternational Data Corp.       59,75         1ona Technologies Ltd.       12	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         53       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1a Information Builders, Inc.       110         1b Informix Software, Inc.       55,59         1a Insurance Value-Added       45         1b Integrated Systems       76,78         30 Integrated Systems       Solutions Corp.       1         1c Intel Corp.       24,48,62,78,80         1nternational Data Corp.       59,75         1ona Technologies Ltd.       12	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         53       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1a Information Builders, Inc.       110         1b Informix Software, Inc.       55,59         1a Insurance Value-Added       45         1b Integrated Systems       76,78         30 Integrated Systems       Solutions Corp.       1         1c Intel Corp.       24,48,62,78,80         1nternational Data Corp.       59,75         1ona Technologies Ltd.       12	Open Soltware Foundation
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         53       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1a Information Builders, Inc.       110         1b Informix Software, Inc.       55,59         1a Insurance Value-Added       45         1b Integrated Systems       76,78         30 Integrated Systems       Solutions Corp.       1         1c Intel Corp.       24,48,62,78,80         1nternational Data Corp.       59,75         1ona Technologies Ltd.       12	Open Software Foundation Oracle Corp
ambar Software arnegie Mellon University	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         53       1         74       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         35       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1a Information Builders, Inc.       110         1b Informix Software, Inc.       55,59         1a Insurance Value-Added       Network Services       76,78         1a Integrated Systems       Solutions Corp.       1         1a Intel Corp.       24,48,62,78,80         1a International Data Corp.       59,75         1a Iona Technologies Ltd.       12         48       1         51       1         39       J. P. Morgan Securities, Inc.       1	Open Soltware Foundation Oracle Corp
ambar Software	51       Houston Chronicle       30         76       Hughes Corp       12         52       Hughes LAN Systems, Inc.       52         53       1         71       IBM       1,4,6,14,16,20,48         52       49,51,55,59,76         55       IBM PC Co.       80         10       IDS Financial Services, Inc.       39         1n formation Builders, Inc.       110         1n Informix Software, Inc.       55,59         1n Insurance Value-Added       Network Services       76,78         30       Integrated Systems       Solutions Corp.       1         112       Intel Corp.       24,48,62,78,80         1nternational Data Corp.       59,75         100       International Data Corp.       59,75         101       J. P. Morgan Securities, Inc.       1         303       J. P. Morgan Securities, Inc.       1         31       J. P. Morgan Securities, Inc.       1         32       J. P. Morgan Securities, Inc.       1         33       J. P. Morgan Securities, Inc.       1         34       J. P. Morgan Securities, Inc.       1	Open Software Foundation Oracle Corp
ambar Software	Houston Chronicle	Open Soltware Foundation Oracle Corp. 1,30,49,55,59,78,  P Pacific Bell
ambar Software arnegie Mellon University	Houston Chronicle	Open Software Foundation Oracle Corp. 1,30,49,55,59,78,  P Pacific Bell
ambar Software	Houston Chronicle	Open Software Foundation
ambar Software	Houston Chronicle	Open Software Foundation
O. H. Brown Associates, Inc. Data General Corp. Dell Computer Corp.	Houston Chronicle	Pacific Bell
ambar Software	Houston Chronicle	Open Software Foundation
ambar Software	Houston Chronicle	Open Software Foundation

ge namber refers to pag
Du Pont Co
Dunkin' Donuts, Inc
E
Eastman Kodak Co 10,30
Edge Research, Inc
Embare Communication
Services
Entergy Corp
Communications, Inc
Euclid Associates
F
Federal Bureau of Investigation28 Federal Communications
Commission 12,76
Federal Express Corp
Mortgage Association
First Albany Corp
Ford Motor Co
Foreeross Corp
Freudenberg-NOK General Partnership1
Fujitsu Ltd
G
Gain Technology, Inc
General Magic, Inc
Glaxo, Inc 51
Gradient Technologies, Inc
GTE Corp
Н
Hewlett-Packard Co
Hill Arts & Entertainment, Inc 16
Houston Chronicle
Hughes LAN Systems, Inc
IBM 1,4,6,14,16,20,48
1BMPC Co
IDS Financial Services, Inc
Information Builders, Inc
Inline Software
Network Services
Solutions Corp 1
Intel Corp
lona Technologies Ltd
J. P. Morgan Securities, Inc 1
JC Penney Co
JetForm Corp
Kaiser Permanente
Keeler Brass Co. 59 KnowledgeWare, Inc. 62
02
Landmark Systems Corp
LCC Computers Inc 39

Link Resources, Inc.       76,78         Locus Computing Corp.       16         Loral Aerospace Corp.       20         Lotus Development Corp.       1,14,15,16,39
М
Magic Valley Regional Medical Center
MainSoft Corp
McDonnell Douglas Corp. 10 MCI Communications Corp. 28 Merisel, Inc. 16
Merrill Lynch & Co.       1         Metricom       12         Microcom, Inc.       76,77,80         Microsoft Corp.       1,4,12,14,15,16,30,39
N
NASDAQ
National Institute of Standards and Technology
National Jewish Center for Immunology and Respiratory Medicine
NCube Corp. 110
NetFrame Systems
Neuron Data, Inc
New Paradigm Software Corp 61
New Science Associates, Inc. 14 New Signals Research 76,78
New York State Electric
and Gas Corp71
Next Computer, Inc
Life Insurance
Nova Corp
Nynex Corp
0
· ·
Oakland University
Oakland University
Oakland University       65         Object Management Group       12         Open Software Foundation       4,30         Oracle Corp       1,30,49,55,59,78,110         P       Pacific Bell       30
Oakland University       65         Object Management Group       12         Open Software Foundation       4,30         Oracle Corp       1,30,49,55,59,78,110         Pacific Bell       30         Pacific Communication       5ciences, Inc.       76,80
Oakland University       65         Object Management Group       12         Open Software Foundation       4,30         Oracle Corp       1,30,49,55,59,78,110         Pacific Bell       30         Pacific Communication       Sciences, Inc.       76,80         Pacific Gas & Electric Co       1,39         Pacifica Hospital       49         Parallel Technology
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Pacific Bell         30           Pacific Communication         Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Pacific Bell         30           Pacific Communication         50           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology           Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Pacific Bell         30           Pacific Communication         30           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         50           Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         Communications Association         80
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Pacific Bell         30           Pacific Communication         50           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology           Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Pacific Bell         30           Pacific Communication         50           Sciences, Inc.         76,80           Pacific Gas & Electric Co.         1,39           Pacifica Hospital         49           Parallel Technology         50           Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         Communications Association         80           Powersoft Corp.         16,48,61           Presbyterian-University Hospital         8           Proxim         77
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           P           Pacific Bell         30           Pacific Communication         Sciences, Inc.           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         Communications Association         80           Powersoft Corp.         16,48,61           Presbyterian-University Hospital         8           Proxim         77           R         80           Racotek         80
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Paeific Bell         30           Paeific Communication         30           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         50           Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         Communications Association         80           Powersoft Corp.         16,48,61           Presbyterian-University Hospital         8           Proxim         77           R           Racotek         80           RadioMail Corp.         76,82
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Paeific Bell         30           Paeific Communication         30           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         50lutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         15           Communications Association         80           Powersoft Corp.         16,48,61           Presbyterian-University Hospital         8           Proxim         77           R           RadioMail Corp.         76,78,80           RAM Mobile Data         76,78,80
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Paeific Bell         30           Paeific Communication         30           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         50           Solutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         15           Communications Association         80           Powersoft Corp.         16,48,61           Presbyterian-University Hospital         8           Proxim         77           R         80           RadioMail Corp.         76,78,80           Reebok International Ltd.         1           Renaissance Information Systems         47
Oakland University         65           Object Management Group         12           Open Software Foundation         4,30           Oracle Corp         1,30,49,55,59,78,110           Paeific Bell         30           Paeific Communication         30           Sciences, Inc.         76,80           Pacific Gas & Electric Co         1,39           Pacifica Hospital         49           Parallel Technology         50lutions, Inc.         55           Patricia Seybold Group         61           PC Forum         4           PECO Energy         39           Pemberton Group         12           Performance Computing, Inc.         15           Portable Computer         Communications Association         80           Powersoft Corp.         16,48,61           Presbyterian-University Hospital         8           Proxim         77           R         80           RadioMail Corp.         76,78,80           Reebok International Ltd.         1

Rust Engineering Co I
S
Sabre Decision Technologies8
Salomon Brothers, Inc
Sharp Corp
SkyTelCorp
Software Maintenance Specialists
Sterling Software, Inc
Systems, Inc
Computer Corp
Sybase, Inc
SynOptics Communications, Inc
· T
Taligent, Inc. 4 Tandy Corp. 76
Target Stores, Inc
Teledesic Corp. 12 Texaco, Inc. 51
Texas Instruments, Inc
The Bocing Co
The First National Bank of Chicago24
The Yankee Group
Traveling Software, Inc
Trusted Information Systems, Inc
U
Unisys Corp
United Parcel Service, Inc
United Parcel Service78
V
Vanstar, Inc
W
Walker Interactive, Inc. 109 Wall Data, Inc. 59
Wang Laboratorics, Inc
Watermark Software, Inc
Wellfleet Communications, Inc. 52 Windata, Inc. 77
Wireless Information Networks Forum
Wireless Telecomm, Inc
X
X/Open Co
Xerox Corp

# Friday Stock Ticker

# **Gainers** Losers Percent McAfee Associates Optical Data Systemsinc. Ross Systems Borland Int'Linc. CREATIVE TECHNOLOGIES INC. Novell Inc. Information Resources(L) Kendall Square Research CE SOFTWARE CAMBEX CORP ANACOMPINC. NETRIX CORP. WELLFLEET COMMUNICATIONS (H) CISCO SYSTEMS INC. SOFTWARE SPECTRUM INC. CONNER PERIPHERALS Dollar MICROSOFT CORP. GENERAL MOTORS E (EDS) (H) BELL ATLANTIC CORP. OPTICAL DATA SYSTEMS INC. CABLETRON SYSTEMS WELLFLEET COMMUNICATIONS (H) CREATIVE TECHNOLOGIES INC. MATSUSHITA ELECTRONICS CISCO SYSTEMS INC. LOTUS DEVELOPMENT (H) TEXAS INSTRUMENTS (H) McAFEE ASSOCIATES DELL COMPUTER CORP. 8 ORLAND INT'L INC. SYMANTEC CORP. NOVELL INC.

THE MIDWEEK INTEREST RATE HIKE PUSHED THE MARKET LOWER LAST WEEK, PULLING DOWN TECHNICAL STOCKS. INVESTORS' DISPLEASURE OVER THE INTENDED BUYOUT OF WORDPERFECT CORP. FURTHER HURT NOVELL, INC.'S SHARE PRICE BUT BOOSTED LOTUS DEVELOPMENT CORP. AND MICROSOFT CORP. STOCK, ANALYSTS SAID.

# Industry Almanac

# Walker races to client/server

Even though Walker Interactive, Inc. (WALK) has not yet jumped onto the client/server bandwagon, its shares closed Wednesday just off a 52-week high at 12<sup>3</sup>/4.

The San Francisco company is working feverishly on a client/server version of its high-end financial software. Right now, however, Walker Interactive sells only mainframe products. Six months ago that focus was regarded as something of an albatross on Wall Street; Walker Interactive's share price was less than \$7 in October 1993.

"I think people are coming to realize the mainframe market is doing better than expected," said David Benhaim, a Boston-based software analyst at First Albany Corp.

He noted that Walker Interactive has continued to win new customers for its mainframe products. Benhaim also said the client/server version is performing well at its first beta site, and it will be one of the most technically advanced client/server financial solutions around when it becomes generally available.

Benhaim said he rates Walker Interactive's stock a Buy. Most client/server companies are trading at 30 times their future earnings per share, which yields a target price of 20 for Walker Interactive by next year, he said. Benhaim said he expects the company's 1995 carnings to be about 80 cents per share.

—Derek Slater



Ехсн	52-Week Range		MAR. 25WK NET WK PCT 3 PM CHANGE CHANGE	Ехсн	52-Week Range	Mar. 25 Wk Net Wk Pct 3 pm Change Change
OTC NYS NYS OTC NYS NYS OTC	63.75 19.63 45.56 35.50 65.00 50.75 66.00 50.75 63.88 50.63 21.50 4.25 15.75 9.50 132.50 79.50 43.00 15.25 60.25 28.75 40.75 19.38 8.80 36.00 13.25 4.25 1.50 7.25 2.25 73.13 25.38 8.25 2.88 8.25 2.88 8.26 3.81 1.63 0.69 17.63 8.00 17.63 8.00 18.13 95.97 71.00 19.88 21.44 19.88 21.44 19.88 21.44 19.88 21.44 19.88 21.44 19.88 21.44 20.60 6.00 11.13 5.38 23.38 8.00 10.50 6.88 73.88 27.50 38.63 21.38 34.00 17.00	Network Services  3 COM Corp. (H)  AMERITECH Corp.  AT&T  8ANYAN SYSTEMS INC.  BELL ATLANTIC CORP.  8ELLSOUTH CORP.  8OLT, RERANER & NEWMAN (H)  8ROOKTROUT TECHNOLOGY  CABLETRON SYSTEMS  CENTIGRAM COMMUNICATIONS  CHIPCOM CORP. (H)  CISCO SYSTEMS INC.  COMPRESSION LABS INC.  CROSSCOMM  DATA SWITCH CORP.  DIGITAL SYSTEMS INT'L INC.  DSC COMMUNICATIONS  FIBRONIX INT'L INC.  GATEWAY COMMUNICATIONS  GENERAL DATACOMM INDS. (H)  GO VIDEO  GTE CORP.  MICROCOMINC. (H)  NETWORK COMPUTING DEVICES  NETWORK EQUIPMENT TECH.  NETWORK GENERAL  NETWORK SYSTEMS CORP.  NETWORK SYSTEMS CORP.  NETWORK SYSTEMS CORP.  NETWORK SYSTEMS CORP.  NOWHERN TELECOM LTD.  NOVELLINC.	0FF 2,15%  61.88	0TC 0TC 0TC 0TC 0TC 0TC 0TC 0TC 0TC 0TC	14.88 4.75 INTERSOLVINC. (H) 18.75 7.75 KNOWLEDGEWARE INC. 14.00 15.50 LEGENT CORP. 86.50 23.50 LOTUS DEVELOPMENT (H) 14.50 4.25 MATHSOFT 10.75 4.50 MCAFEE ASSOCIATES 17.25 7.88 MENTOR GRAPHICS (H) 37.50 13.13 MICROFOCUS 11.63 4.38 MICROSOFT CORP. 37.75 15.88 ORACLE CORP. 44.75 22.50 PARAMETRIC TECHNOLOGY 41.38 26.00 PEOPLESOFT (H) 6.25 3.50 PHOENIX TECHNOLOGIES (H) 6.950 22.00 POWERSOFT (H) 39.75 9.50 PLATINUM SOFTWARE 16.75 7.25 PLATINUM TECHNOLOGY 60.25 32.25 PROGRESS SOFTWARE CORP. 4.09 1.94 QUARTERBECK OFFICE SYS. 13.00 17.00 RAINBOW TECHNOLOGIES INC. 11.38 4.25 RASTEROPS 15.25 4.50 ROSS SYSTEMS 28.75 11.00 SAPIENS INTL. CORP. N.V. 14.38 5.50 SOFTWARE TOOLWORKS INC. 13.75 6.25 STATE OF THE ART 35.63 17.63 STERLING SOFTWARE INC. 51.25 25.38 SYMANTEC CORP. 24.25 11.50 SYBASE INC. 30.00 13.50 VIEWLOGIC SYSTEMS 12.38 5.50 WALKER INTERACTIVE SYSTEM	11.00 -0.63 -5.4 8.75 0.25 2.9 32.38 -1.38 -4.1 14.63 -0.63 -4.1 46.75 -3.13 -6.3 17.75 1.50 9.2 45.50 0.13 0.3 16.25 -0.75 -4.4 4.25 0.25 -5.6 29.00 0.13 0.4
_	48.88 35.38 30.00 19.00 18.25 8.75 7.50 3.75 27.25 13.50 8.25 3.63 38.88 22.38 47.00 36.75 40.25 29.50 42.75 20.00 15.25 2.88 46.00 18.25 50.75 38.50 87.75 38.50 87.75 38.50 37.53 30.00 15.25	NYNEX CORP. (L) OCTEL COMMUNICATIONS CORP. OPTICAL DATA SYSTEMS INC. PENRIL DATA COMM NETWORKS PICTURETEL CORP. PROTEON INC. SCIENTIFIC ATLANTA INC. SOUTHWESTERN BELL CORP. SPRINT CORP. STANDARD MICROSYSTEMS CORP. STANDARD MICROSYSTEMS CORP. STANDARD MICROSYSTEMS CORP. STRATACOM INC. SYNOPTICS COMMUNICATIONS TELEBIT CORP. (H) US ROBOTICS US WEST INC. (L) WELLFLEET COMMUNICATIONS (H) XIRCOM XYPLEX INC.  S ADVANCED LOGIC RESEARCH	35.88 · 0.75 · 2.0 27.25 · 0.88 · -3.1 16.50 · 2.50 · 17.9 6.88 · 0.00 · 0.0 13.50 · 0.75 · 5.3 6.50 · 0.38 · 5.5 31.00 · 0.38 · 5.5 31.00 · 0.38 · 1.2 40.88 · 0.38 · 0.9 34.63 · 0.13 · 0.4 17.75 · 0.88 · 4.7 18.13 · 0.38 · 2.1 22.00 · 3.38 · 13.3 13.25 · 1.25 · 8.6 39.25 · 1.25 · 3.1 40.75 · 1.38 · 3.5 71.25 · 14.75 · 17.2 25.50 · 1.25 · 4.7 17.75 · 0.50 · 2.7	NYS NYS OTC OTC NYS OTC NYS OTC NYS OTC NYS OTC NYS OTC NYS OTC ASE OTC	32.88 16.75 31.13 17.13 ADVANCED MICRO DEVICES 31.13 17.13 ATMEL CORP. (H) 7.50 2.75 CHIPS AND TECHNOLOGIES 44.63 13.00 CIRRUS LOGIC 20.00 11.75 DALLAS SEMICONDUCTOR (O 20.00 11.75 DALLAS SEMICONDUCTOR (H) 74.50 42.75 INTEL CORP. 22.63 10.50 LSI LOGIC CORP. (H) 26.75 12.25 LATTICE SEMICONDUCTOR 95.50 19.25 MICRON TECHNOLOGY (H) 10.975 62.63 MOTOROLA INC. (H) 25.00 12.00 NATIONAL SEMICONDUCTOR (H) 12.25 6.50 SIERRA SEMICONDUCTOR (H) 12.25 6.50 SIERRA SEMICONDUCTOR (H) 12.36 6.50 SIERRA SEMICONDUCTOR (H) 18.88 6.50 VLSI TECHNOLOGY 14.38 5.13 WEITEK 20.38 3.63 WESTERN DIGITAL CORP. (H) 3.77 2.150 AND TECHNOLOGY 3.150 AND TECHNOLOGY 3.150 AND TECHNOLOGY 4.77 3.150	18.00 -1.38 -7.1 70.13 -1.63 -2.3 21.75 -0.50 -2.2 18.63 0.13 0.7 86.63 -1.13 -1.3 103.75 -4.50 -4.2 8.50 -0.38 -4.2 81.00 -5.13 -6.0 15.63 0.50 3.3 8.38 -0.13 -1.5 18.00 -1.88 -9.4 53.75 -2.00 -3.6
OTC OTC NYS NYS OTC OTC NYS NYS OTC NYS	7.25 2.50 59.13 22.00 33.00 12.75 5.13 2.50 104.88 43.13 36.50 13.50 25.00 16.75 93.63 64.38 26.88 11.75 32.63 21.13 50.75 27.88 5.38 2.50	ADVANCED LOGIC RESEARCH APPLE COMPUTER INC. AST RESEARCH INC. COMMODORE INT'L COMPAQ COMPUTER CORP. (H) DELL COMPUTER CORP. GATEWAY 2000 INC. HEWLETT PACKARD CO. SILICON GRAPHICS (H) SUN MICROSYSTEMS INC. TANDY CORP. ZEOS INTERNATIONAL LTD.	7.13 0.38 5.6 33.25 -3.00 -8.3 22.25 -1.50 -6.3 3.00 0.00 0.0 100.00 -3.63 -3.5 28.38 1.63 6.1 18.88 -0.38 -1.9 84.25 -4.50 -5.1 25.38 -1.13 -4.2 27.75 -2.50 -8.3 40.88 -2.13 -4.9 3.38 0.25 8.0	OTC OTC OTC OTC ASE NYS OTC OTC ASE NYS	40.75 21.50 ZILOG INC.    Pherals and Subsystems   29.50 12.25	34,75 ·1.75 ·4.8  OFF 1.73%  N (H) 26.75 ·1.88 ·6.6 23.13 ·0.38 ·1.6 4.75 0.44 10.1 4.38 ·0.13 ·2.8 16.13 ·2.75 ·14.6 23.25 ·8.25 ·26.2 9.25 0.38 4.2 5.63 0.38 7.1 21.38 ·1.13 ·5.0
ASE NYS OTC NYS NYS NYS NYS NYS	7.38 4.38 7.63 3.63 4.50 1.88 33.75 20.38 12.63 7.13 48.25 27.75 52.25 33.88 60.00 40.63 25.75 33.88 176.00 106.25 18.75 12.75 26.00 9.25 23.25 11.25 23.25 11.25 23.25 11.25 23.25 11.25 23.25 11.25 23.25 11.25 23.25 10.88 16.50 9.88	AMDAHL CORP. CONVEX COMPUTER CRAY COMPUTER CRAY RESEARCH INC. (H) DATA GENERAL CORP. DIGITAL EQUIPMENT CORP. HARRIS CORP. 18M KENDALL SQUARE RESEARCH MATSUSHITA ELECTRONICS NETFRAME PARALLAN COMPUTER PYRAMID TECHNOLOGY SEQUENT COMPUTER SYS. SEQUENT SYSTEMS INC. STRATUS COMPUTER INC. TANDEM COMPUTERS INC. (H) TRICORD SYSTEMS UNISYS CORP.	0FF 3.65%  6.63 -0.13 -1.9 6.63 0.00 0.0 2.50 -0.13 -4.8 31.38 -1.50 -4.6 7.50 -0.13 -1.6 31.63 -1.25 -3.8 48.88 -2.13 -4.2 54.13 -2.88 -5.0 4.75 -1.00 -17.4 164.00 -7.50 -4.4 15.75 -1.50 -8.7 12.50 0.75 -6.4 13.25 -0.75 -5.4 13.38 -1.25 -8.5 6.06 -0.03 -0.5 26.25 -2.38 -8.3 14.88 -0.38 -2.5 16.25 1.00 6.6 15.63 -0.13 -0.8	OTC NYS OTC OTC NYS OTC OTC NYS NYS NYS	12.25 5.25 EMULEX CORP. 21.00 14.25 EVANS & SUTHERLAND 22.50 7.50 EXABYTE (H) 34.00 7.50 INTELLIGENT INFO. SYSTEMS 5.13 2.25 IOMEGA CORP. 9.75 5.75 IPL SYSTEMS INC. 28.50 13.75 KOMAG INC. 8.75 4.38 MAXTOR CORP. 8.38 4.88 MICROPOLIS CORP. (H) 117.00 99.88 3M CORP (L) 9.50 6.25 PRINTRONIX INC. 17.25 7.50 QMS INC. 20.25 9.38 QUANTUM CORP. 9.13 3.13 RADIUS INC. 17.75 11.75 RECOGNITION INTERNATIONAL 6.88 3.63 REXON INC. 28.75 13.13 SEAGATE TECHNOLOGY 45.00 21.75 STORAGE TECHNOLOGY 32.63 21.38 TEKTRONIX INC. (H) 103.25 69.88 XEROX CORP.	12.25 0.00 0.0 19.00 0.50 2.7 21.38 -0.38 -1.7 8.25 -0.50 -5.7 2.56 0.06 2.5 8.25 0.38 4.8 24.75 -1.00 -3.9 8.13 0.63 8.3 7.63 0.00 0.0 99.88 -2.25 -2.2 9.25 0.63 7.2 8.50 -0.88 -9.3 17.63 1.25 -6.6 8.50 0.13 -1.4 13.13 0.75 6.1 6.50 0.00 0.0 25.00 -3.38 -11.9 35.38 -2.38 -6.3 31.13 1.25 4.2 97.75 -1.75 -1.8
Soft  OTC  OTC  OTC  OTC  OTC  OTC  OTC  OT	37.00 16.25 34.50 13.50 8.88 5.13 25.00 6.75 61.75 37.00 4.50 2.38 41.00 24.00 71.00 38.75 28.25 20.38 27.25 12.00 4.63 2.75 44.50 19.00 14.25 6.00 14.25 6.00 14.25 19.25 12.75 5.75 22.00 6.81 10.25 3.38 29.25 8.75 25.00 7.25 11.13 5.25 11.13 5.25 11.13 5.25 11.13 5.25 11.20 6.13 29.50 11.25 44.75 18.25 27.25 13.38 12.38 8.50 9.88 4.88	ADOBE SYSTEMS INC. ALDUS CORP. (H) AMERICAN SOFTWARE INC. ASK COMPUTER SYSTEMS (L) AUTODESK INC. BACHMAN INFO. SYSTEMS BGS SYSTEMS INC. BMCSOFTWARE INC. BOOLE & BABBAGE BORLANO INT'L INC. CE SOFTWARE CHEVENNE SOFTWARE INC. (H) COGNOS INC. COMPUTER ASSOCIATES COMPUTERVISION CORP. (H) COMPUWARE CORP. (H) COMSUMARE INC. (H) COREL CORP. FILENET CORP. FILENET CORP. FILENET CORP. HOGAN SYSTEMS INC. IMRS INFORMATION RESOURCES (L) INFORMATION RESOURCES (L) INFORMAT CORP. INTERGRAPH CORP. INTERGRAPH CORP. INTERGRAPH CORP. INTERGRAPH CORP.	0FF 1,40%  26.50 -3.13 -10.5  29.50 -3.00 -9.2  5.75 -0.13 -2.1  7.75 0.25 3.3  59.50 0.75 1.3  3.00 0.13 4.3  24.00 -1.75 -6.8  64.75 -4.25 -6.2  23.88 -0.38 -1.5  14.63 1.63 12.5  3.75 0.38 11.1  41.00 -2.00 -4.7  11.63 -0.25 -2.1  37.00 -1.63 -4.2  5.00 0.25 5.3  43.50 -2.50 -5.4  11.75 -0.38 -3.1  20.88 1.00 5.0  5.75 -0.25 -4.2  27.75 -0.50 -1.8  8.13 0.13 1.6  9.50 0.02 -2.6  9.00 0.00 0.0  28.88 0.88 3.1  9.50 -1.00 -9.5  25.88 0.13 0.5  18.25 -4.00 18.0  21.25 -2.00 -8.6  9.63 -0.13 -1.3  7.63 -0.88 -10.3	OTC	23.75 14.88 AMERICAN MGMT. SYSTEMS 4.25 2.38 ANACOMP INC. 23.50 14.50 ANLYSTS INT'L 56.88 46.88 AUTO DATA PROCESSING 23.88 13.00 CERIDIAN CORP. (H) 24.25 13.88 COMDISCO INC. 11.84 4.56 COMPUTER HORIZONS (H) 41.75 23.34 COMPUTER TASK GROUP 35.00 17.38 COMPUTER SCIENCES A.75 6.00 COMPUTER SOFTWARE 14.00 8.75 COMPUTER SOFTWARE 16.00 7.00 CORPORATE SOFTWARE 16.00 12.00 INTELLIGENT ELECTRONICS 12.75 INACOM CORP. 10.00 12.00 INTELLIGENT ELECTRONICS 12.13 9.75 MERISEL 10.00 12.00 MERISEL 10.00 12.00 MERISEL 10.00 12.00 INTELLIGENT ELECTRONICS 10.00 12.00 MERISEL 10.00 12.00 SOFTWARE 10.00 SO	36.25 2.63 7.8 18.25 -0.75 -3.9 25.75 -1.00 -3.7 22.00 0.38 1.7 31.13 -0.63 -2.0 35.25 -2.50 -6.6 34.75 -2.50 -6.7 23.00 -0.75 -3.2 23.50 0.13 0.5
COPYRI THIS INI INTERN.	GHT NORDBY INTE FORMATION IS BAS ATIONAL AND COM	HIGH REACHED IN PERIOO (L) = NEW A RNATIONAL, INC. LOUISVILLE, CO. SED ON SOURCES BELIEVED TO BE REL IPUTERWORLO ASSUME NO LIABILITY NORDBY INTERNATIONAL AT (800) 92	IABLE, AND WHILE EXTENSIVE FOR ANY INACCURACIES. FOR	VE EFFORT	rs are made to assure its accuracy, no guara ation on Nordby International's Data-On-Di	NTEES CAN BL MADE NOPDBY EMANO SERVICES FOP ANY OF THE

Second-ciass postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385697. Computerworld (ISSN 0010-4841) is published weekly: except a single combined issue for the last week in Decen.berand (he first week in Da Cally Lov Computerworld, Inc., 375 Cochituate Road, Box 9171. Framingham, Mass. 01701-9171. Copyright 1994 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbur, Mich., ab106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCO, provided that the base fee of \$3,00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 oc opines) and permission to reprint may be purchased from Sharon Bryant, CW Publishinglinc., 375 Cochituate 8.04, Box 9171. Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if fee every deviation is of the support of the last week in Decen.berand (he first week in Decen.berand

# INDUSTRY PULSE: Telecommunications

Companies	Calendar year 1993 (in billions)	Percent change from 1992 to 1993	
ATRIC TO THE STATE OF THE STATE	\$39.86	0.7%	
BellSouth Corp.	\$15.89	4.5%	
GTE Corp.	\$15.83	(0.2)%	
Nynex Corp.	\$13.41	1.8%	
Bell Atlantic Corp.	\$12.99	2.3%	
MCI Communications Corp.	\$11.92	12.9%	
Ameritech Corp.	\$11.71	5.0%	
Southwestern Bell Corp.	\$10.69	6.7%	
US West, Inc.	\$10.40	3.6%	
Pacific Telesis Group	\$10.00	3.0%	
Sprint Corp. (Long-distance service)	\$6.14	8.5%	
Sprint Corp. (Local exchange service)	\$4.13	6.8%	

Source: Gartner Group, Inc.'s Yardstick, 1994, Stamford, Conn.

# Emerging services and technologies market (in millions)

	1992	1993	1994*	1995*	1996*
Frame-relay service	\$14.7	\$57.0	\$152.7	\$336.9	\$591.7
Switched Multimegabit Data Service	\$3.0	\$4.1	\$11.8	\$40.0	\$74.4
Asynchronous Transfer Mode service	\$30.0	\$54.0	\$130.7	\$342.4	\$640.3

\*Projected

Source: North American Telecommunications Association's "1993-1994 Telecommunications Market Review and Forecast," Washington



# The 5th Wave by Rich Tennant



# Inside Lines

# Summertime Notes for AIX and HP/UX

Lotus cracked the lid just a little wider last week on its plans for Unix versions of Notes. Last week, at the '94 PC Forum conference in Phoenix, Lotus Senior Vice President John Landry said HP/UX and AIX users can expect native Notes implementations sometime this summer, with the HP/UX version leading by four to six weeks.

# Will Kahn tough it out at Borland?

Borland CEO Philippe Kahn said last week he will remain in charge "as long as shareholders want me to" but acknowledged that his performance in the past year has sometimes been poor. Also wavering was his commitment to go ahead with Sidekick for Windows, which is in beta testing and is likely to sell for less than \$40.

# Thinking caps for commercial users ...

Thinking Machines plans to announce marketing deals with database makers Oracle and Dharma next week that will be targeted at commercial — not scientific — users of its massively parallel systems. IS managers from American Express' Epsilon project are expected to be at the Cambridge, Mass., meeting to stump for Thinking Machines' MPP technology. Epsilon is a giant data mining project that aims to build a view of Americans based on what people buy with Amex cards.

# Amdahl goes massive with Oracle and NCube

Amdahl will announce tomorrow an alliance with Oracle and NCube to build a massively parallel database query engine for large corporations with distributed computers, sources said. The system will reportedly use connectivity software from Information Builders to link Amdahl's large-scale mainframes with an NCube MPP machine running a parallel Oracle server.

# Year-end ship date for Chicago still holds

A senior Microsoft official last week stood his ground on the late 1994 ship date promised for Chicago. The official, who asked not to be named, said the only remaining question is whether Microsoft can make its internal Halloween ship target. Apparently the company anticipates a major holiday selling season and would like to see Chicago under a lot of trees this year.

# Sun brightens up its object strategy

SunSoft will be publishing a roadmap for the company's object strategy next week at the Sun developer's conference, industry sources said. Included in the announcement are expected dates for integrating Project Distributed Objects Everywhere with products from Next and Iona Technologies, Inc., as well as interoperability with OLE and other implementations of CORBA, such as IBM's Distributed System Object Model.

# Will the next Ray Noorda please stand up?

The rumor mill at Novell's Brainshare conference last week tagged 1BM honcha Ellen Hancock as the most likely outsider to succeed Ray Noorda for the Novell CEO slot. She did deliver the keynote speech at the developer's conference and later lunched with Ray, but former Apple CEO John Scully is said to be a popular choice as well. Insider favorites include John Edwards and Ad Rietveld, president and CEO of Novell's future subsidiary, WordPerfect.

# Three-peat for Digital

On April 12, Digital plans to make the third in a series of announcements aimed at convincing customers it deserves a place in the client/server world. Among the anticipated hardware announcements is a four-processor, superserver-class Alpha AXP machine, code-named Sable. It will use the Peripheral Component Interconnect bus and run Windows NT plus DEC OSF/1 and OpenVMS. Pricing will start at \$25,000.

To get in touch with Computerworld about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.

# Sure they're fast.

Sitting behind the wheel of a Pentium<sup>™</sup> processor is like driving one of those sports cars that private eyes in Hawaii drive.

screen, windows open like they've got some grease in the tracks, and everything just plain moves faster.

But if that's not fast



# But at these prices,

But maybe you're not a private eye in Hawaii.
Maybe you have to stick to a budget.

That's not a problem anymore.

enough for you, we'll soup the whole thing up to 66 MHz for a few bucks more. Just ask for our LPx 566.

you can afford

The new DECpc™LPx 560 has a high-performance Pentium chip and a low sticker price. Just \$2,499.\* Not only that, the LPx has our local PCI bus.

Of course, both models come standard with our three-year limited warranty.

Now you can blow



# the speeding tickets.

Put any other bus with a Pentium chip and you're sticking a dinky carburetor on a racing engine.

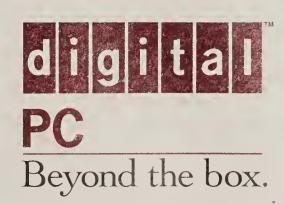
With a local PCI bus, graphics snap onto the

down the highway without a lot of money in your pocket.

That expensive speed trap is gone.

Call 1-800-670-9547.

Please reference BYD when you call. 8:30 a.m. to 8:00 p.m. Mon-Fri ET.



<sup>o</sup>Monitor not included.



**KEYS for MVS and VSE** 

Respond to problems and queries quickly and conveniently with KEYS, the powerful Automated Help Desk System. The flexibility of KEYS enables you to choose the best combination of platforms for your needs, from a single PC to the largest data center environment. Share data between PCs, across networks and with the host-based KEYS systems.

- Call/Problem Tracking
- Change Management
- Customer Service
- Multiple-keyword Search
- Hardware/Software Inventory
   Extensive Reporting Capability
   Expert System
- Problem Resolution
- Statistical Displays

Unlock the power of your help desk with KEYS.

For a no-obligation free trial or further details, call 1-800-272-7322.



SOFTWARE ENGINEERING OF AMERICA®
1230 Hempstead Turnpike, Franklin Square, New York 11010
(516) 328-7000 Fax: (516) 354-4015